NSW STATE EMERGENCY SERVICE

Byron Shire

Local Flood Emergency Sub Plan

FloodSafe

BYRON SHIRE
FLOOD EMERGENCY
SUB PLAN

A Sub Plan of the Local Emergency Management Plan (EMPLAN)

Volume 1 of the Byron Shire Flood Emergency Sub Plan

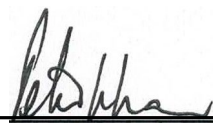
Endorsed by the Tweed Byron Local Emergency Management Committee

Endorsed Date 10th May 2023

AUTHORISATION

The Byron Shire Flood Emergency Sub Plan is a sub plan of the Tweed Byron Local Emergency Management Plan (EMPLAN). It has been prepared in accordance with the provisions of the ***State Emergency Service Act 1989*** **(NSW)** and is endorsed by the Local Emergency Management Committee in accordance with the provisions of the ***State Emergency and Rescue Management Act 1989*** **(NSW).**

Authorised

Signature: 

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Print Name: PETER MAIR

Date: 10 MAY 2023

Endorsed

Signature: 

Chair, Local Emergency Management Committee

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Date: 17 MAY 2023

VERSION HISTORY

Version Number	Description	Date
2	Byron Shire Flood Emergency Sub Plan	July 2013
1	Byron Shire Local Flood Plan	February 2006

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

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Amendments in the list below have been entered in this plan.

DISTRIBUTION LIST

Available for general use and distribution on the NSW State Emergency Service website www.ses.nsw.gov.au

CONTENTS

1 OUTLINE AND SCOPE

1.1 PURPOSE

1.1.1 The purpose of this plan is to set out the multi-agency arrangements for the emergency management of flooding in the Byron Shire Local Government Area (LGA).

1.2 AUTHORITY

1.2.1 This plan is written and issued under the authority of the *State Emergency and Rescue Management Act 1989* (NSW) ('SERM Act'), the *State Emergency Service Act 1989* (NSW) ('SES Act') and the NSW State Emergency Management Plan (EMPLAN).

1.2.2 This plan is a sub plan to the Tweed Byron Local Emergency Management Plan (EMPLAN) and is endorsed by the Tweed Byron Local Emergency Management Committee (LEMC).

1.3 ACTIVATION

1.3.1 This plan does not require activation. The arrangements set out in this plan are always active.

1.3.2 The Tweed Byron Emergency Management Plan (EMPLAN) is active at all times in anticipation of the need to coordinate support and resources requested by Combat Agencies, including the NSW State Emergency Service (NSW SES).

1.4 SCOPE

1.4.1 The area covered by this plan is the Byron Shire LGA. The Byron Shire LGA and its principal towns, villages, rivers and creeks are shown in Appendix A.

1.4.2 The Council area is in the NSW SES North Eastern Zone and for emergency management purposes, is part of the North Coast Emergency Management Region.

1.4.3 The plan sets out the emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Byron LGA.

1.4.4 In this plan a flood is defined as a relatively high-water level which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves (including tsunami) overtopping coastline defences.

1.4.5 The arrangements for dealing with episodes of coastal erosion by severe weather, are described in the NSW State Storm Sub Plan.

1.4.6 The arrangements for the emergency management of tsunami are dealt with in the NSW State Tsunami Emergency Sub Plan.

1.5 GOALS

1.5.1 The primary goals for flood emergency management in NSW are:

a. Protection and preservation of life.

b. Establishment and operation of flood warning systems.

c. Issuing of community information and community warnings.

d. Coordination of evacuation and welfare of affected communities.

e. Protection of critical infrastructure and community assets essential to community survival during an emergency incident.

f. Protection of residential property.

g. Protection of assets and infrastructure that support individual and community financial sustainability and aid assisting a community to recover from an incident.

h. Protection of the environment and conservation values considering the cultural, biodiversity and social values of the environment.

1.6 KEY PRINCIPLES

1.6.1 The protection and preservation of human life (including the lives of responders and the community) is the highest priority.

1.6.2 Evacuation is the primary response strategy for people impacted by flooding.

1.7 ROLES AND RESPONSIBILITIES

1.7.1 General responsibilities of Emergency Service Organisations and Functional Areas are set out in the NSW State EMPLAN and NSW State Flood Sub Plan.

1.7.2 Specific roles and responsibilities for Agencies, Functional Areas and Organisations in relation to flooding within Byron Shire are detailed within this plan, Appendix B and Appendix C.

1.7.3 Any agency with agreed responsibilities in this plan that are temporarily unable, or no longer able to fulfil their responsibilities in response operations must as soon as possible notify:

a. The NSW SES Incident Controller (for local or zone level responsibilities during response operations).

b. The NSW SES Zone Duty Commander (for regional level responsibilities outside of response operations).

1.8 PLAN MAINTENANCE AND REVIEW

1.8.1 NSW SES will maintain the currency of this plan by:

a. Ensuring that all supporting Emergency Services and Functional Areas, Organisations and officers mentioned in it are aware of their roles and responsibilities.

b. Conduct a minimum of one exercise every five years or within two years of the plan being reviewed.

c. Reviewing the contents of the plan:

- When there are changes which alter agreed plan arrangements.

- When changes to land use strategic plans and policies increase the population at risk.
- After a flood including recommendations from after action reviews, reports, or inquiries.
- As determined by the NSW SES Commissioner.

d. The plan is to be reviewed no less frequently than every five years or after a significant flood event.

1.9 SUPPLEMENTARY DOCUMENTS

1.9.1 Supplementary and supporting material of the Local Flood Emergency Sub Plan is maintained on the NSW SES website at: https://www.ses.nsw.gov.au/about-us/flood-storm-and-tsunami-plans/ including:

a. Flood Plan Glossary.

b. NSW SES Resupply Flowchart.

2 OVERVIEW OF NSW FLOOD HAZARD AND RISK

2.1 THE FLOOD THREAT

NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Byron LGA.

3 PREVENTION/ MITIGATION

3.1 INTRODUCTION

3.1.1 The Flood Risk Management Manual outlines the NSW Government's Flood Prone Land Policy which details the framework for managing flood prone land in New South Wales. Incorporation of floodplain risk management into land use planning is one of the key means to limit the exposure to flood risks to our communities and help build long term resilience to future flood events.

3.2 LAND USE PLANNING

3.2.1 **Strategy:** Effective land use planning is a key focus for minimising the impacts of flooding. NSW SES will work with land use planning and consent authorities to inform and influence the consideration of the risks arising from flood, storm and tsunami, to prevent the creation of intolerable impacts of these hazards on the community.

Actions:

a. NSW SES will provide strategic input about land use planning matters which have or will create significant flood risk to life and/or property due to flooding.

b. NSW SES will provide responses to land use planning proposal referrals that have or will create significant flood risk to life and/or property due to flooding.

3.3 FLOODPLAIN RISK MANAGEMENT

3.3.1 **Strategy**: Advocate for consideration of emergency management in decision making to reduce risks to the existing community and minimise the growth in future, continuing and residual risk due to development through input to the floodplain management program.

Actions:

a. NSW SES will provide coordinated and consistent emergency management advice to councils and other agencies in relation to the management of land that is subject to flooding or coastal inundation.

b. NSW SES will provide advice, support, technical resources and training for NSW SES representatives to contribute effectively on local Floodplain Management Committees.

4 PREPARATION

4.1 INTRODUCTION

4.1.1 Preparation includes arrangements or plans to deal with an emergency or the effects of an emergency.

4.2 FLOOD EMERGENCY PLANNING

4.2.1 **Strategy**: NSW SES develop, review and maintain Flood Emergency Sub Plans.

Actions:

a. Develop and review this NSW SES Local Flood Emergency Sub Plan as required. Local Flood Emergency Sub Plans outline the specific arrangements for management of flood events within an LGA, and may include cross boundary arrangements.

b. Review plans as per Section 1.8.

4.2.2 Local EMPLAN Consequence Management Guides (CMG's) for flood are not required for communities covered by NSW SES Local Flood Emergency Sub Plans however may be utilised in place of Local Flood Emergency Sub Plan if agreed to by NSW SES.

4.3 FLOOD INTELLIGENCE SYSTEMS

4.3.1 **Strategy**: NSW SES develop and maintain a flood intelligence system to identify flood behaviour, its impact on the community and required response actions.

Actions:

a. Gather and assess flood information for the full range of flood types and severities.

b. Collect, collate, and assess information on the characteristics of communities at risk and the potential effects of flooding on communities at risk.

c. Share flood intelligence information with supporting agencies.

4.4 DEVELOPMENT OF WARNING SYSTEMS

4.4.1 **Strategy**: Develop, maintain and prepare systems for the provision of flood warnings and associated warning services.

Actions:

a. All levels of government work in partnership to develop and maintain flood warning infrastructure.

b. NSW SES maintains a list of the requirements for flood warnings for flood gauges in NSW (including flood classifications, warning times required and key statistics) and can be found in the supplementary document to the NSW State Flood Plan (see Section 1.9).

c. NSW SES will recommend new warning services and changes to warning alert levels for gauges to the NSW and ACT Flood Warning Consultative Committee.

d. The State Government, in partnership with Local Government, is responsible for developing and maintaining flash flood warning systems for local catchments where required.

e. NSW SES maintains a dedicated dam failure hotline and procedures to ensure priority dissemination of dam failure warnings.

f. NSW SES develops and maintains warning and flood information products by:

- Utilising flood intelligence data.
- Developing warning and flood information products.
- Continuously reviewing warning and flood information products.
- Consulting with affected communities, key stakeholders, Dam Safety NSW and the NSW and ACT Flood Warning Consultative Committee, and maintains Operational Readiness.
- Participating in the development of public information and warning systems.

g. Gauge owners adequately maintain flood warning gauges and systems, including those identified in the 'Service Level Specification' maintained by the Bureau of Meteorology and those identified in the 'Provision and Requirements for Flood Warning in New South Wales maintained by NSW SES.

4.5 BRIEFING, TRAINING AND EXERCISING

4.5.1 **Strategy**: Ensure NSW SES, supporting agencies, Functional Areas and the community are prepared and familiar with the strategies and arrangements within the Flood Emergency Sub Plan and supporting documents.

Actions:

a. NSW SES will consult stakeholders throughout the development of plans.

b. NSW SES will inform stakeholders of content changes after revisions.

c. NSW SES will ensure their facilities and resources are maintained and operationally ready.

d. NSW SES will train personnel for their expected flood operation roles.

e. NSW SES will regularly brief stakeholders on the exercise arrangements contained in the NSW Flood Emergency Sub Plan.

4.6 COMMUNITY RESILIENCE TO FLOODING

4.6.1 **Strategy**: NSW SES provides and maintains a flexible volunteer workforce to support community resilience.

Actions:

a. Ensure ongoing recruitment and training of a diverse range of volunteers.

b. Ensure pre-planning to facilitate the management of spontaneous volunteers and community members during a flood.

4.6.2 **Strategy**: NSW SES works with individuals, communities, businesses and government agencies to build flood resilience.

Actions:

a. Partners with and engage communities to understand and manage the risks associated with floods, including providing business continuity guidance (NSW SES Business FloodSafe), family preparedness (NSW SES Home FloodSafe) and other engagement strategies.

b. NSW SES will collate, assess and disseminate flood information to the community.

c. Collaborate with individuals, businesses, government agencies and communities when developing flood intelligence, preparedness and response information.

d. Plan for floods collaboratively with communities through community and stakeholder participation and engagement.

e. Collaborate with community sector and recognise the needs of individuals within communities who have an increased susceptibility during floods.

5 RESPONSE

5.1 INTRODUCTION

5.1.1 Flood response operations will begin:

a. On receipt of a Bureau of Meteorology Severe Weather Warning or Thunderstorm Warning that includes heavy rain or storm surge; or

b. On the receipt of a Bureau of Meteorology Flood Watch or Flood Warning; or

c. On receipt of warnings for flash flood; or

d. On receipt of a dam safety alert; or

e. When other evidence leads to an expectation of flooding.

5.2 INCIDENT MANAGEMENT ARRANGEMENTS

5.2.1 **Strategy**: Maintain effective control of flood operations across NSW.

Actions:

a. NSW SES uses the Australasian Inter-service Incident Management System (AIIMS) to manage the flood response.

b. Control of flood response will be at the lowest effective level and may be scaled to suit the incident.

c. NSW SES State Controller (or delegate) will appoint Incident Controllers and establish Incident Control Centres (see NSW SES facilities on map in Appendix A).

d. NSW SES Incident Controller, in consultation with participating supporting Emergency Services and Functional Areas will determine the appropriate breakdown of an Area of Operations into Divisions and/or Sectors in accordance with the principles of AIIMS.

5.2.2 **Strategy**: Maintain Incident Control Centre(s).

Actions:

a. NSW SES will operate Incident Control Centre(s) as required.

b. NSW SES Incident Control Centre(s) will:

- Control resources from NSW SES and coordinate resources of supporting Emergency Services and Functional Areas.
- Manage Request for Assistance (RFA) tasking and ensure they are actioned in a timely manner.
- Undertake response planning and determine future resourcing requirements.
- Coordinate information flow, including warnings, public information and social media.

5.2.3 **Strategy**: Provide effective liaison between NSW SES and supporting agencies or Functional Areas in accordance with Local EMPLAN.

Actions:

a. Supporting Emergency Services and Functional Areas should provide Liaison Officers to NSW SES Incident Control Centre(s) and/or Emergency Operation Centres as required.

b. NSW SES will provide Liaison Officer(s) to Emergency Operations Centres as required.

c. Where possible Emergency Operation Centres to be co-located with NSW SES Incident Control Centres for Flood Emergency Response.

5.2.4 **Strategy**: Coordinate resources and logistics support to ensure operational effectiveness.

Actions:

a. The NSW SES Incident Controller will notify agencies of potential access issues between locations, for the consideration of pre-deploying of resources.

b. NSW SES may request resources and logistics support directly from a

supporting Emergency Service or Functional Area.

c. Wherever possible, supporting Organisations are to provide their own logistic support in consultation with NSW SES where appropriate.

d. The NSW SES Incident Controller will control air support operations and may utilise supporting agencies in the management of aircraft.

5.3 USE OF INFORMATION AND COLLECTION OF INTELLIGENCE

5.3.1 **Strategy**: Ensure flood information is effectively utilised, communicated and collected during and after a flood.

Actions:

a. Information relating to the consequences of flooding, response strategies, situational awareness and operational updates will be distributed by NSW SES to supporting Emergency Services and Functional Areas listed under this Plan.

b. All supporting Emergency Services, Functional Areas and Council will accurately record and report information relevant to their activities and any real time flood information (including road closure information) to the NSW SES Incident Controller. This may be in the form of a combined Emergency Operations Centre (EOC) report, or direct from agencies where an EOC has not been established.

c. NSW SES may establish and operate a Joint Intelligence Unit to coordinate the collection, collation, interpretation, mapping, actioning and dissemination of information.

d. Reconnaissance, mapping, damage assessments, intelligence validation and post flood evaluation will be coordinated by NSW SES. This may occur post impact and continue into the recovery phase.

e. NSW SES may request Engineering Services Functional Area to assist with the gathering of flood intelligence including (but not limited to) maximum flood extents, peak flood heights, recording major flood damage at key high velocity locations and preparation of After-Flood Reports.

5.3.2 **Strategy**: Ensure flood intelligence is incorporated into operational decision-making.

Action: NSW SES will use flood intelligence, official forecasts, warnings, and flood scenario products to undertake an assessment of the predicted impact of a flood and to inform operational decision-making.

5.4 PROVISION OF INFORMATION AND WARNINGS TO THE COMMUNITY

5.4.1 **Strategy**: Timely and effective warnings are distributed to the community.

Actions:

a. The Bureau of Meteorology issues public weather and flood warning products before and during a flood. These may include:

- Severe Thunderstorm Warnings - Broad-based - issued for the entire Australian State or territories affected highlighting broad areas where severe storms may occur within the next 3 hours.

- Severe Weather Warnings with reference to heavy rainfall and/or storm surge.
- Flood Watches.
- Flood Warnings.

b. NSW SES Incident Controllers will issue the following NSW SES Flood Warnings aligning to the Australian Warning Systems:

- Advice.
- Watch and Act, and
- Emergency Warning.

c. NSW SES liaises with the Bureau of Meteorology to discuss the development of flood warnings as required.

d. NSW SES provides alerts and deliver flood information to affected communities using a combination of public information.

e. NSW SES may request supporting agencies redistribute NSW SES alerts and information, including through the provision of doorknocking teams.

f. Road closure information will be provided to the community through the following agencies/methods:

- Local Government Council websites/Emergency Dashboards.
- Transport for NSW 'Live Traffic' website: www.livetraffic.com or 'Transport InfoLine': 131 500. VMS messaging or signage on roadways may also be used to advise motorists.

g. The Public Information and Inquiry Centre will be established by NSW Police Force where required to provide information regarding evacuees and emergency information. Contact details will be broadcast once the centre is established.

h. The Disaster Welfare Assistance Line will be established by Disaster Welfare Services where required to provide information on welfare services and assistance. Assistance line contact details will be broadcast once Disaster Welfare Services commence.

5.5 PROTECTION OF PROPERTY

5.5.1 **Strategy**: Coordinate the protection of property from destruction or damage arising from floods.

Action: NSW SES, supporting agencies, and community volunteers will assist the community (where resources are available, feasible and safe to do so) in:

a. The protection of properties including critical infrastructure through flood protection systems (e.g. sandbagging) to minimise entry of water into buildings.

b. The raising or moving of household furniture and commercial stock/equipment.

5.6 ROAD AND TRAFFIC CONTROL

5.6.1 **Strategy**: Coordinate the closing and re-opening of flood affected roads.

Actions:

a. Byron Shire will coordinate the closure and reopening of council managed roads once inspections have been carried out by the relevant authority.

b. Transport for NSW will coordinate the closure and reopening of the state road network.

c. NSW Police Force may close and re-open roads but will normally only do so (if the Byron Shire Council or Transport for NSW have not already acted and if public safety requires such action.

d. NSW SES will assist with erecting road closure signs and barriers when time and resources permit.

5.6.2 **Strategy**: Coordinate traffic control measures in flood affected areas.

a. The NSW SES Incident Controller may direct the imposition of traffic control measures into flood affected areas in accordance with the provisions of the *State Emergency Service Act, 1989* and the *State Emergency Rescue Management Act, 1989.*

b. The NSW SES Incident Controller may request the Local Emergency Operations Controller provide suitable personnel to assist with traffic coordination.

5.7 PROTECTION OF ESSENTIAL SERVICES

5.7.1 Arrangements for the protection of local assets are outlined in the Local and Regional EMPLANS. In addition, Local and Region EMPLAN's contain infrastructure inventories.

5.7.2 **Strategy**: Minimise disruption to the community by ensuring protection of infrastructure and supply of essential energy, utility services and lifelines.

Actions:

a. Transport Services Functional Area is to coordinate the provision of information about the assessment and restoration of transport network infrastructure.

b. Energy and Utility Services Functional Area is to coordinate the assessment and restoration of essential energy and utility services (not including telecommunications).

c. Telecommunications Services Functional Area is to coordinate the assessment and restoration of telecommunications and the Public Safety Network.

d. Engineering Services Functional Area is to coordinate the:

- Assessment and restoration of critical public buildings for example hospitals.
- Assessment and operation of flood protection levees.
- Protection of property.
- Construction and repair of levees.

- Water supply and sewerage operations.
- Other critical infrastructure.

e. Functional Areas and Council will keep NSW SES informed of the status of utilities and infrastructure.

5.8 EVACUATION

5.8.1 Evacuation is NSW SES's primary response strategy for managing the population at risk of flooding.

5.8.2 **Strategy**: Conduct planning to ensure all evacuation constraints are considered.

Actions:

a. Evacuations will take place when there is a risk to public safety. Circumstances may include:

- Evacuation of people when their homes or businesses are likely to flood.
- Evacuation of people who are unsuited to living in isolated circumstances, due to flood water closing access.
- Evacuation of people where essential energy and/or utility services are likely to fail or where buildings have been or may be made uninhabitable.

b. NSW SES will consider the following in evacuation decisions:

- Duration of evacuation.
- Characteristics of the community.
- Numbers requiring evacuation.
- Availability of evacuation routes and transport.
- The ability for existing levees or other flood protection works to fulfil their intended function.
- Time available for evacuation.
- Evacuee management requirements.
- Resources and delivery of evacuation information.
- Length of isolation.

c. NSW SES Incident Controllers, planning and intelligence officers will carefully consider the risks involved in conducting evacuations.

d. All evacuation decisions will be made as per the current NSW SES policies and procedures, and consistent with the NSW Evacuation Management Guidelines.

e. Potential Evacuation Centres are located in the Local EMPLAN.

f. NSW Police Force will coordinate the provision of overall security for evacuated areas.

5.8.3 **Strategy**: Evacuate people pre-emptively from dangerous or potentially dangerous places and or locations created by the flood hazard to safe locations away from

the hazard.

a. NSW SES will control and coordinate the evacuation of affected communities.

b. NSW SES Commissioner (or delegate) will warn communities to prepare for a possible evacuation, where circumstances allow such lead time.

c. NSW SES Commissioner (or delegate) will order any necessary evacuations and provide information to the community about when and how to evacuate.

d. Support to evacuation operations may be requested from other Emergency Services and supporting agencies using arrangements in the local EMPLAN and supporting plans.

e. Health Services Functional Area will coordinate the evacuation of hospitals, and assist where appropriate with health centres and aged care facilities (including nursing homes) in consultation with NSW SES and Welfare Services and ensure that appropriate business continuity plans are developed for essential health infrastructure and are activated during the floods as per the NSW Health Services Supporting Plan (HEALTH PLAN, 2013).

   In the event of an emergency impact of any magnitude or type affecting a Residential Aged Care Facility or private hospital facility, the decision making and resolution regarding the requirement to evacuate will be the responsibility of the facility management in consultation with the relevant combat agency.

f. School administration offices (Government and Private) will coordinate the evacuation of schools in consultation with NSW SES and Welfare Services, if not already closed.

g. Caravan Park proprietors will inform the NSW SES Incident Controller when caravan park evacuations have been completed.

h. People who are reluctant or refuse to comply with any Emergency Warning will be referred to NSW Police Force.

5.9 EVACUEE MANAGEMENT AND WELFARE

5.9.1 Research and experience in flood operations shows that most evacuees go to family, friends and commercial accommodation outside the impact area.

5.9.2 **Strategy**: Maintain the welfare of communities and individuals affected by the impact of a flood.

Actions:

a. NSW SES will provide initial welfare for evacuees where required but will hand the responsibility over to the Welfare Services Functional Area as soon as possible. NSW SES will brief the Welfare Services Functional Area at the earliest opportunity regarding the level of assistance required.

b. Welfare Services Functional Area will manage evacuation centres for affected residents and travellers in accordance with the Welfare Services Functional Area Supporting Plan.

c. Schools Administration (Government and Private) will manage the safety of students directly affected by flooding and will work with NSW SES in the

temporary closure of schools and will coordinate with NSW SES, Transport and Welfare Services in the management of school evacuees.

d. Disaster Victim Registration will be controlled and coordinated by NSW Police Force with the assistance of NSW SES and Welfare Services Functional Area.

e. NSW SES will provide details of all residents assisted in evacuations to the Welfare Services Functional Area as early as possible.

f. Where the expected remaining number of evacuees and the duration of evacuation is assessed to be beyond the capability and capacity of the

established evacuation centre arrangements the SEOCON may establish Major Evacuation Centres or Mass Care facilities.

g. The decision to establish Major Evacuation Centres or Mass Care Facilities will be made by NSW SES and SEOCON in consultation with members of the State Emergency Management Committee.

5.9.3 **Strategy**: Coordinate available and accessible health services for flood affected communities.

Action: The provision of environmental health advice, assessment of public health risks and coordination of immediate mental health support will be provided by Health Services Functional Area.

5.9.4 **Strategy**: Maintain the welfare of animals impacted by a flood.

Actions:

a. Agriculture and Animal Services Functional Area will coordinate the welfare of livestock, pets, companion animals and wildlife including support to primary producers, animal holding establishments and community members.

b. Agriculture and Animal Services Functional Area role will coordinate the evacuation, emergency care of animals and assessment, humane destruction and disposal of affected animals, and supply of emergency fodder, water and aerial support where necessary.

5.10 FLOOD RESCUE

5.10.1 **Strategy**: Control and coordinate flood rescue of people and domestic animals.

Actions:

a. NSW SES will perform flood rescue, where training and equipment is suitable and where a risk assessment has indicated that the risk to rescuers is acceptable.

b. Flood rescue operations will be conducted in accordance with the State rescue Board NSW State Rescue Policy which sets out the framework, governance, responsibilities and requirements for the management and conduct of flood rescue in NSW.

c. NSW SES may request other supporting Emergency Services to undertake flood rescues on behalf of NSW SES. Agencies must be authorised/accredited to undertake flood rescue operations in accordance with State Rescue Board requirements, as prescribed by NSW SES. Supporting Emergency Services must supply information regarding rescues performed to NSW SES. Notification arrangements with NSW Police Force are outlined in the State rescue Board NSW State Rescue Policy.

d. Rescue agencies will conduct rescue of domestic small and large animals as per the State rescue Board NSW State Rescue Policy (and may include Large Animal Rescue of family horses and cows at a residence or property). The rescue of livestock (which includes commercial animals found on farming and breeding enterprises) will be coordinated through Animal and Agriculture Services Functional Area.

5.11 RESUPPLY

5.11.1 **Strategy**: Coordinate resupply to towns and villages isolated by flooding to minimise disruption to the community.

Actions:

a. NSW SES will advise communities and businesses if flood predictions indicate that areas are likely to become isolated, and indicative timeframes where possible.

b. Retailers should be advised to ensure sufficient stock is available for the duration of the flood.

c. When isolation occurs, NSW SES will establish loading points where retailers can instruct suppliers to deliver goods.

d. NSW SES will endeavour to support the delivery of mail to isolated communities but may not be able to do so according to normal Australia Post timetables.

e. NSW SES will assist hospitals with resupply of linen and other consumables where able.

f. NSW SES may request resupply assistance from supporting agencies.

g. NSW SES may conduct resupply operations as per the designated resupply plan for the event.

h. Where additional supplies are required Engineering Services Functional Area be requested to coordinate the supply of goods and services in response to and recovery from the emergency.

5.11.2 **Strategy**: Coordinate resupply to rural properties isolated by flooding.

Actions:

a. When requested, NSW SES will establish a resupply schedule and coordinate the resupply for isolated rural properties.

b. NSW SES will provide local suppliers with designated loading points. Resupply items are to be packaged by the supplier.

c. Isolated households unable to afford resupply items will be referred to the Welfare Services Functional Area for assistance.

5.12 RETURN

5.12.1 **Strategy**: Coordinate the safe return of communities to flood affected areas when the immediate danger to life and property has passed.

Actions:

a. The NSW SES Incident Controller will determine when it is safe to progressively return in consultation with the relevant Emergency Operations Controller and supporting agencies considering the ongoing risk to public safety.

b. The NSW SES Incident Controller will specify the level of access to affected communities as the following:

- Not suitable for access; or
- Limited access by Emergency Services and response Agencies; or
- Limited access by residents and/or business operators; or
- Full access.

c. The NSW SES Incident Controller will issue an Advice Warning advising "Reduced Threat: Return with Caution" when the immediate danger to life and property has passed for areas.

d. NSW SES will facilitate the return of evacuees to their homes.

5.13 END OF RESPONSE OPERATIONS

5.13.1 **Strategy**: Conclude response operations.

Actions:

a. Response operations will conclude when:

- There is a reduced likelihood of additional flooding within the Area of Operation and flood waters have receded.
- All requests for assistance related to the flood have been completed.
- The need for warning and evacuation no longer exists.
- There is no further likelihood of rescuing people.
- Resupply is no longer required (resupply operations may occur concurrently with the recovery phase).
- Response to fire and hazardous material incidents have concluded (not including subsequent clean-up of contaminated sites).
- All affected areas have had an "Reduced Threat: Return with Caution" issued.

5.14 POST IMPACT ACTIONS

5.14.1 **Strategy**: Learnings from the event are used to inform recovery and future events.

Actions:

a. NSW SES will continue to engage with communities after significant floods through convening one or more community forums, workshops or other opportunities to provide communities a chance to provide feedback, address any concerns and provide input into the recovery process. These will typically include other agencies such as the Bureau of Meteorology, Welfare Services and Byron Shire Council representatives.

b. NSW SES will conduct After Action Reviews, at the conclusion of response operations, which will involve all stakeholders. Findings will be shared and incorporated into improved disaster resilience planning.

c. NSW SES will provide information and data throughout the emergency response to inform community recovery. A report will be developed at the request of the SERCON at the conclusion of the response within an area.

Should a response summary report be required it will include the following:

- The emergency action plan in place at conclusion of the response emphasising any continuing activities including community meetings/ engagement activities.
- Resources allocated to the emergency response and associated exit strategies.
- Details of any areas or situations with potential to re-escalate the emergency.
- A recommendation for the conclusion of NSW SES as lead agency to transition to the NSW Reconstruction Authority as the lead agency for Recovery.
- Any actions that are incomplete or outstanding.
- Damage Assessment Data and Information obtained throughout the response phase which will further support the long-term recovery of communities.

d. NSW SES will undertake/coordinate a comprehensive review of intelligence and plans following significant flood events.

5.14.2 **Strategy:** Participate in post flood data collection analysis.

Actions: NSW SES works with relevant stakeholders and Byron Shire Council on post flood data collection analysis including review of flood intelligence where necessary.

6 RECOVERY OPERATIONS

6.1 INTRODUCTION

6.1.1 Recovery is the process of returning an affected community to its proper level of functioning after an emergency. It will generally commence simultaneously with the Response phase.

6.1.2 Recovery operations will be initiated and conducted as outlined in the NSW State EMPLAN and as further detailed in the NSW Recovery Supporting Plan. The Tweed Byron Local Recovery Plan provides a framework for the management and coordination of local recovery operations.

6.2 NSW SES RECOVERY ROLE

6.2.1 **Strategy**: NSW SES will support recovery operations and established Recovery Committees.

Actions:

a. NSW SES will provide representation to Recovery Committees as required and may have an ongoing role in the Recovery phase.

b. NSW SES roles on Recovery Committees may include providing information about any continuing response, guidance on mitigation strategies and general advice and assistance to the committee as a subject matter specialist and/or

expert.

c. NSW SES will provide information to the NSW Reconstruction Authority to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.

d. NSW SES, in conjunction with a Recovery Committee, will provide a service to support the information needs of a community immediately following a flood.

e. NSW SES and where required supporting agencies will assist with clean-up operations after floods, where possible when resources and personnel permit.

f. NSW SES may coordinate immediate relief in collaboration with the SEOCON and SERCON.

7 ABBREVIATIONS

For a full list of abbreviations refer to the NSW State Flood Plan - Abbreviations

8 GLOSSARY

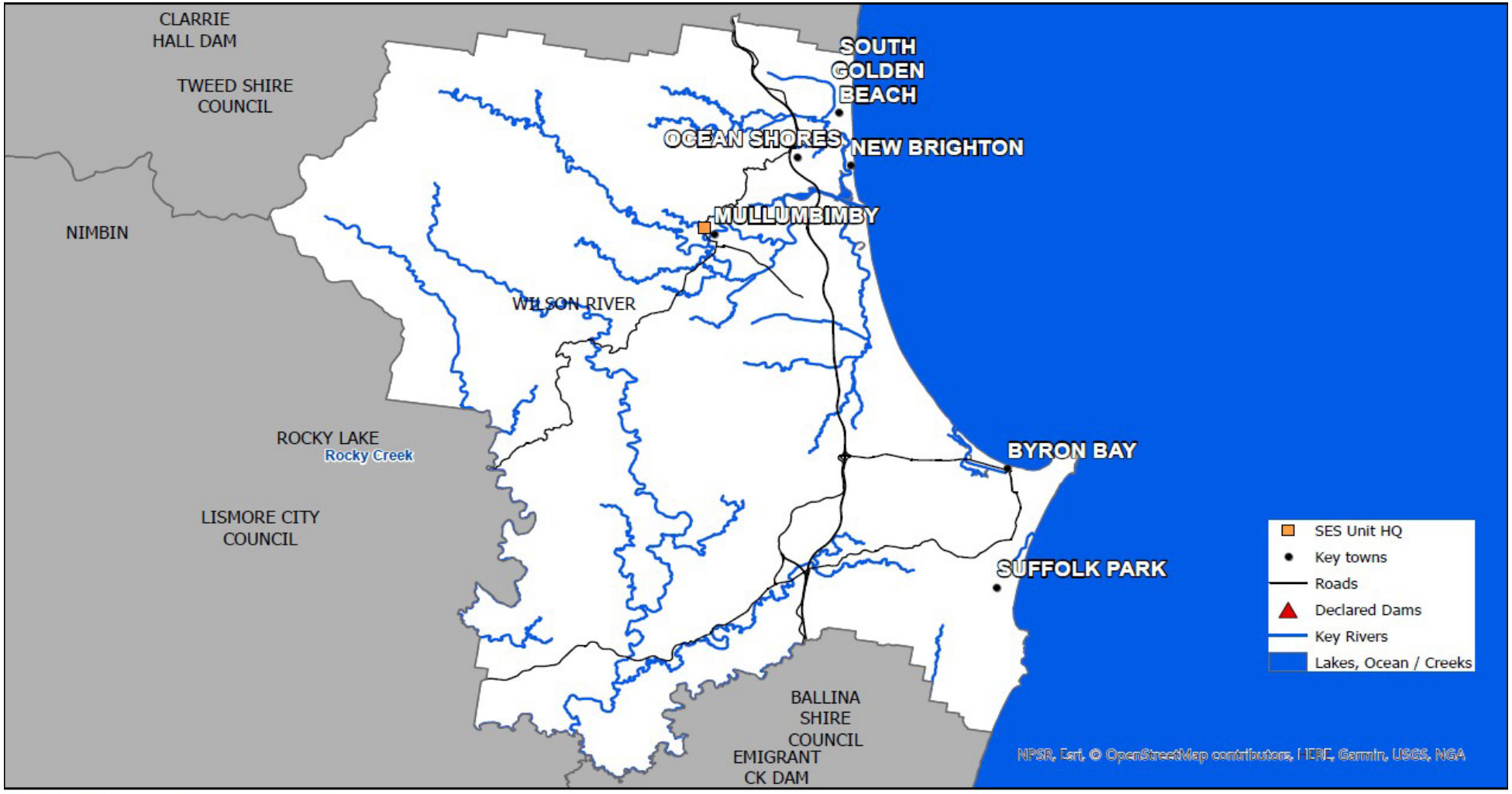
Common emergency service terminology can be found within the Australian Disaster Resilience Glossary.

Readers should refer to EMPLAN Annex 9 – Definitions.

Refer to the NSW State Flood Plan for a complete glossary of terminology used throughout this plan and within NSW SES Flood Plans.

For a full list of definitions refer to the Supporting Document - State Flood Plan Glossary
https://www.ses.nsw.gov.au/media/2650/glossary.pdf

9 Appendix A - Map of Bryon Shire LGA Area



SES
NSW STATE EMERGENCY SERVICE

N

4 2 0 4 7 11 15
Kilometers

Byron Bay LGA

DISCLAIMER This map publication is presented by the NSW State Emergency Service for the purpose of disseminating emergency management information free of charge to members of emergency management organisations. The information in this map publication is not intended for use by the general public or untrained persons, and is not a substitute for professional advice and/or training. Untrained persons should not use this map publication unless they are under the supervision of trained and qualified emergency management personnel. The State Emergency Service disclaims any liability (including for negligence) to any person in respect of anything and the consequences of anything, done, or not done by any such person in whole or partial reliance upon the whole or part of the information in this map publication.

10 Appendix B – Roles and Responsibilities

AGENCY	RESPONSIBILITIES
NSW State Emergency Service	NSW SES is the designated Combat Agency for floods, storms and tsunami and controls response operations. NSW SES roles and responsibilities in relation to floods are outlined in the NSW State Flood Emergency Sub Plan.

AGENCY	RESPONSIBILITIES
Agriculture and Animal Services Functional Area	The roles and responsibilities for Agriculture and Animal Services are outlined in the Agriculture and Animal Services Supporting Plan and NSW State Flood Plan.
Australian Government Bureau of Meteorology	The roles and responsibilities for the Australian Government Bureau of Meteorology are outlined in the NSW State Flood Plan.
Byron Shire Council	**Preparedness** • Establish and maintain floodplain and coastal risk management committees and ensure that key agencies are represented. • Develop and implement floodplain risk management plans in accordance with the NSW Government's Flood Prone Land Policy and the NSW Floodplain Development Manual. • Provide levee studies, flood studies and floodplain management studies to NSW SES. • Coordinate the development of warning services for catchments prone to flash flooding (small catchments), where appropriate. • Maintain council-owned flood warning networks and flood mitigation works. • Participate in NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Sub Plans. • Contribute to community engagement activities. **Response** • Subject to the availability of council resources, assist NSW SES with flood operations including: - Traffic management on council managed roads. - Provision of assistance to NSW SES. - Property protection and sandbagging of Council owned facilities. - Assist with the removal of caravans from Council managed caravan parks.

AGENCY	RESPONSIBILITIES
	• Warning of residents and other people in flood liable areas. • Technical advice on the impacts of flooding. • Close and reopen council roads (and other roads nominated by agreement with Transport for NSW) and advise NSW SES, NSW Police Force and people who contact the council for road information. • Assist NSW SES to provide sandbag filling facilities to residents and businesses in areas where flooding is expected. • Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations. • Maintain and operate established flash flood warning systems. • Operate established flood mitigation works including critical structures such as detention basins, flood pumps, flood gates and levees, and advise NSW SES regarding their operation. • Manage and protect council-owned infrastructure facilities during floods. • Provide advice to NSW SES and the Health Services Functional Area during floods about key council managed infrastructure such as sewerage treatment and water supply. • Advise the Environmental Protection Authority of any sewerage overflow caused by flooding. • Manage the disruption to water supply and sewerage services. • Work with NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events. **Recovery** • Provide for the management of health hazards associated with flooding including removing debris and waste from public lands under the care and control of Council. • Ensure all Council owned, and managed facilities are fit and safe for reoccupation and assess any need for demolition. • Provide services, assistance and advice to State Government in accordance with the State Recovery Plan.
Caravan Park Proprietor(s)	• Prepare a flood emergency plan for the Caravan Park. • Ensure that owners and occupiers of movable dwellings are aware that the caravan park is flood liable by providing a written notice to Occupiers taking up residence and displaying this notice and

AGENCY	RESPONSIBILITIES
	emergency management arrangement within the park. • Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should: – Provide the manager of the caravan park with a contact address and telephone number in case of an emergency. – Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e.: should ensure that the wheels, axles and draw bar of the caravans are not removed and are maintained in proper working order). • Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to: – Ensure that they have spare batteries for their radios. – Listen to a local radio station for updated flood information. – Prepare for evacuation and movable dwelling (cabins) relocation. • Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation when flooding occurs. • Coordinate the evacuation of people and the relocation of movable dwellings when floods are rising and their return when flood waters have subsided. Movable dwellings will be relocated back to the caravan park(s) by owners or by vehicles and drivers arranged by the park managers. • Secure any movable dwellings that are not able to be relocated to prevent floatation. • Inform NSW SES of the progress of evacuation and/or movable dwellings relocation operations and of any need for assistance in the conduct of these tasks.
Childcare Centres and Preschools	• When notified of possible flooding or isolation, childcare centres and preschools should. – Liaise with NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures. – Assist with coordinating the evacuation of preschools and childcare centres.
Dams Safety NSW	The roles and responsibilities for Dams Safety NSW (formerly NSW Dam Safety Committee) are outlined in the NSW State Flood Plan.

AGENCY	RESPONSIBILITIES
Department of Defence	Arrangements for Defence Assistance to the Civil Community are detailed within the State EMPLAN (section 448).
Energy and Utilities Services Functional Area	The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN). Roles and responsibilities in addition to the Supporting Plan are: • Assist NSW SES with identification of infrastructure at risk of flood damage where resources are available. • Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: – Provide advice to NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection. – Advise NSW SES of any hazards from utility services during flooding and coastal erosion/inundation. – Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply. – Clear or make safe any hazard caused by power lines or electricity distribution equipment. – Reconnect customers' electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow. – Assist NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.
Engineering Services Functional Area	The roles and responsibilities for Engineering Services are outlined in the Engineering Services Supporting Plan and NSW State Flood Plan.
Environmental Services Functional Area	The roles and responsibilities for Environmental Services are outlined in the Environmental Services (ENVIROPLAN) Supporting Plan.
Floodplain Management Australia	The roles and responsibilities for Floodplain Management Australia are outlined in the NSW State Flood Plan**.**
Fire and Rescue NSW	The roles and responsibilities for Fire and Rescue NSW are outlined in the NSW State Flood Plan.
Forestry Corporation of NSW	The roles and responsibilities for Forestry Corporation of NSW are outlined in the NSW State Flood Plan.
Health Services Functional Area	The roles and responsibilities for Health Services are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
Local Emergency Operations Controller (LEOCON)	• Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.

AGENCY	RESPONSIBILITIES
Local Emergency Management Officer (LEMO)	• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Manly Hydraulics Laboratory (MHL)	The roles and responsibilities for Manly Hydraulic Laboratory are outlined in the NSW State Flood Plan.
Marine Rescue NSW	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.
NSW Ambulance	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission	The roles and responsibilities for NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission are outlined in the NSW State Flood Plan.
NSW Department of Planning and Environment (Environment and Heritage Group)	The roles and responsibilities for NSW Department of Planning and Environment (Environment and Heritage Group) are outlined in the NSW State Flood Plan (referred to as DPIE EES).
NSW Department of Planning and Environment (Water)	The roles and responsibilities for NSW Department of Planning and Environment (Water) are outlined in the NSW State Flood Plan.
NSW Food Authority	The roles and responsibilities for NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
NSW National Parks and Wildlife Services	The roles and responsibilities for NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.
NSW Police Force	The roles and responsibilities for NSW Police Force are outlined in the NSW State Flood Plan.
NSW Rural Fire Service	The roles and responsibilities for NSW Rural Fire Service are outlined in the NSW State Flood Plan.
Public Information Services Functional Area	The roles and responsibilities for Public Information Services are outlined in the Public Information Services Supporting Plan and NSW State Flood Plan**.**
NSW Reconstruction Authority	The roles and responsibilities for the NSW Reconstruction Authority are outlined in the NSW State Flood Plan.
SEOCON/SEOC	The roles and responsibilities for the SEOCON/SEOC are outlined in the NSW State Flood Plan**.**
Surf Life Saving NSW	The roles and responsibilities for Surf Life Saving NSW are outlined in the NSW State Flood Plan.

AGENCY	RESPONSIBILITIES
Telecommunications Services Functional Area	The roles and responsibilities for Telecommunications Services are outlined in the Telecommunications Services (TELCOPLAN) Supporting Plan.
Transport for NSW (TfNSW)	• Transport for NSW (TfNSW) coordinates information on road conditions for Emergency Services access. • Transport for NSW (TfNSW) coordinates the management of the road network across all modes of transport. • Transport for NSW (TfNSW) in conjunction will assist NSW SES with the evacuation of at-risk communities by maintaining access and egress routes. • Assist NSW SES with the communication of flood warnings and information provision to the public through Live Traffic and Social Media according to the VMS protocols and procedures. • Assist NSW SES with identification of road infrastructure at risk of flooding.
Transport Services Functional Area	The roles and responsibilities for Transport Services are outlined in the Transport Services Functional Area Supporting Plan and NSW State Flood Plan.
VRA Rescue NSW	The roles and responsibilities for VRA Rescue NSW are outlined in the NSW State Flood Plan.
Water NSW	The roles and responsibilities for Water NSW are outlined in the NSW State Flood Plan.
Welfare Services Functional Area	The roles and responsibilities for Welfare Services are outlined in the Welfare Services Functional Area Supporting Plan and NSW State Flood Plan.

11 Appendix C – Community Specific Roles and Responsibilities

NSW SES Community Action Teams (CATs) **Current CATs – Billinudgel**	**Prevention** • Maintain awareness of land use and development in their local community that may become a flood hazard or be impacted by flooding and inform the SES Unit Commander of any concerns. **Preparedness** • Be involved in local emergency planning processes – set up communication links and phone trees. • Inform new residents of any flood threat and local procedures. • Act as the point of contact between the NSW SES and the community. **Response** • Inform local NSW SES about flood conditions and response needs. Where able, support community with low skill level tasks e.g. sandbagging, assisting the vulnerable and neighbours. • Disseminate flood information to local community, including flood and evacuation warnings. **Recovery** • Assist with community clean-up if required and able to do so. • Participate in After Action Reviews if required.
Community Resilience Networks	• The Council has a Community Resilience Network (CRN) that brings together local community organisations such as sporting clubs, community recreation and cultural groups, school groups, faith-based groups, Landcare groups, surf clubs and Progress Associations. • These act as a community reference connection to the Local Emergency Management Committee, contributing to emergency planning activities and the development of local Recovery Plans. • This enables community capabilities and resources to be incorporated into emergency and recovery planning and support an all hazards approach to emergency preparedness. • During an emergency, the CRN also acts as a community reference network when a recovery committee is established, to facilitate collaboration between the committee and community services and assist with coordination of recovery initiatives. • They operate under the auspices of the Local Recovery Officer and are integral to the Local Recovery Sub-Plan.

	• Provide awareness of local hazards and risks. • Provide awareness of Emergency Management arrangements in NSW. • Conduct tabletop exercises to practice recovery processes. • Share recovery needs between communities and the formal recovery system if established.
Community Resilience Teams	– Community Resilience Teams (CRT's) are a Red Cross initiative. They form at a local level to prepare their communities before emergencies using the all-hazards approach, the PPRR model and local knowledge. – Be aware of local hazards and risks and build community resilience before emergencies. – Provide aware of roles of emergency services and combat agencies. – Build community resilience. – Provides a platform to begin recovering after an emergency. – Establishing telephone trees and street coordinators to create community and neighbourhood connections are strategies used to disseminate warnings and to collect information. – Emergency Service Organisations can use the CRT communication systems to convey warnings and obtain feedback from the community during an event. – Some CRT's are formalised by Incorporation and have/are seeking funding for local resilience projects.
Community Members	**Preparedness** • Understand the potential risk and impact of flooding. • Prepare homes and property to reduce the impact of flooding. • Understand warnings and other triggers for action and the safest actions to take in a flood. • Households, institutions and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees and neighbours. • Have an emergency kit. • Be involved in local emergency planning processes. **Recovery** • Assist with community clean-up if required and able to do so. • Participate in After Action Reviews if required.
Aboriginal organisations or groups	• Act as the point of contact between NSW SES and the Bundjalung community. • Disseminate flood information, including flood and evacuation warnings, to the Bundjalung community

HAZARD AND RISK IN BYRON SHIRE

Volume 2 of the Byron Shire Flood Emergency Sub Plan

Last Update: November 2023

AUTHORISATION

The Hazard and Risk in the Byron Shire Council has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process. The information contained herein has been compiled from the latest available technical studies.

Approved

Signature

NSW SES Coordinator Planning

Print Name: Michael Stubbs

Date: 7 November 2023

Approved

Signature:

NSW SES North Eastern Zone Commander

Print Name: Joanna Jones

Date: 7 November 2023

Date Tabled at LEMC 8 November 2023

CONTENTS

LIST OF TABLES

VERSION LIST

The following table lists all previously approved versions of this Volume.

Description	Date
Byron Shire Local Flood Plan	February 2006

AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

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Amendments promulgated in the amendments list below have been entered in this Volume.

Amendment Number	Description	Updated by	Date

Document Issue: Version 3-02052016

1 THE FLOOD AND COASTAL EROSION THREAT

1.1 OVERVIEW

a. Byron Shire is located on the Far North Coast of New South Wales, about 800kms north of Sydney. Byron Shire is bounded by Tweed Shire in the north, the Coral Sea in the east, Ballina Shire in the south, and Lismore City and Tweed Shire in the west. In 2021 the population of Byron Shire was 36,116 as recorded by the 2021 Census of Population and Housing (1).

b. The area covered by the plan is the Byron Shire Council area which includes:

- The townships of: Bangalow, Brunswick Heads, Byron Bay, Mullumbimby, Ocean Shores;
- The villages and closely settled areas of: Billinudgel, Broken Head, South Golden Beach, Bayside Brunswick, New Brighton, Suffolk Park, Sunrise Beach; and
- The rural localities of: Binna Burra, Booyong, Ewingsdale, Eureka, Federal, Goonengerry, Hayters Hill, Huonbrook, Koonyum Range, Main Arm, McLeods Shoot, Middle Pocket, Myocum, Montecollum ,Nashua, Newrybar (part), Nightcap (part), Talofa, The Pocket, Tyagarah, Upper Coopers Creek, Upper Main Arm, Upper Wilsons Creek, Wanganui, Whian Whian (part), Wilsons Creek, Wooyung (part) and Yelgun (2).

c. The Byron Shire is predominantly a rural Shire with urban centres of Byron Bay, Mullumbimby, Bangalow, Ocean Shores and Brunswick Heads containing the majority of the Shire's population.

d. Major features of the Shire include: *Arakwal National Park, Goonengerry National Park, Mount Jerusalem National Park, Nightcap National Park, Andrew Johnston Big Scrub Nature Reserve, Billinudgel Nature Reserve, Broken Head Nature Reserve, Brunswick Heads Nature Reserve, Cumbebin Swamp Nature Reserve, Hayters Hill Nature Reserve, Inner Pocket Nature Reserve, Marshalls Creek Nature Reserve, Snows Gully Nature Reserve, Tyagarah Nature Reserve, Cape Byron State Conservation Area, Whian Whian State Conservation Area, Cape Byron Marine Park, Cape Byron Lighthouse, Minyon Falls, numerous beaches, Byron Regional Sports and Cultural Complex and the Brunswick River*

e. The Byron Shire covers the whole of the Brunswick Valley and a small portion of the Wilson River catchment within the Richmond River Basin and has one of the highest annual rainfalls in the State. The two major rivers, the Brunswick and Wilson Rivers, provide inland water systems for fishing and boating and add to the area's scenic attraction. The mouth of the Brunswick River feeds into the Pacific Ocean at Brunswick

Heads with tidal flows pushing the river west into minor streams and tributaries of the Brunswick Valley and Mullumbimby flood plains.

f. Both the Wilson and Brunswick rivers flood in times of heavy rain, as do many of the minor streams and tributaries. Those areas most affected are the Marshalls Creek Floodplain, Wilsons Creek with 12 level creek crossings, and Main Arm with approximately 15 creek crossings. The Wilsons River and its tributaries affect the central and southern parts of the Shire and ultimately continue through Lismore to join the Richmond River. In times of significant rainfall Upper Wilsons Creek, Upper Main Arm, Huonbrook and The Pocket can be isolated due to peak flows from other catchment areas (3).

g. Byron Bay is affected by water levels in the Belongil Creek and Suffolk Park by Tallow Creek.

1.2 LANDFORMS AND RIVER SYSTEMS

BRUNSWICK RIVER BASIN

a. **The Brunswick River Basin is comprised of four distinct areas:**

- The Brunswick River and its tributaries (including Mullumbimby Creek).
- Marshalls and Yelgun Creek and its tributaries (North Arm of the Brunswick River).
- Simpsons Creek (South Arm of the Brunswick River).
- Durrumbul Catchment (Northwest Arm of the Brunswick River).

b. **The Brunswick River (Main Arm).** The Brunswick River (Main Arm) has its headwaters in a steep sided relatively narrow valley in the Northwest corner of the Byron Shire. It flows in a generally Southeast direction towards Mullumbimby before heading East North East to Brunswick Heads. The Brunswick River is joined near Mullumbimby by Mullumbimby and Kings Creeks. The Main Arm of the Brunswick River and its tributaries drain the steep narrow valleys in the Northwestern half of the Shire. Downstream at Brunswick Heads it is joined by Marshalls Creek (North Arm) and Simpsons Creek (South Arm) before emptying into the sea. The main automatic river level gauge monitored by the Bureau of Meteorology (BoM) is Mullumbimby (Federation Bridge), gauge reference (202402-558006). This gauge is measured in metres, AHD.

c. **Marshalls Creek (North Arm).** Marshalls Creek and its tributaries, Yelgun and Lacks Creeks form the North Arm of the Brunswick River. Marshalls Creek and tributaries have their catchment areas in the northern part of the shire. It is characterised by narrow steep sided valleys running from West to East, and is located slightly North of the Chincogan Mountain Range and above the coastal swamps which lie to the North of South Golden Beach and New Brighton. Marshalls Creek flows into the Brunswick River approximately 800m from the mouth of the river. Townships within the Marshalls Creek catchment include

Billinudgel, South Golden Beach, New Brighton and Ocean Shores. The catchment is bisected in a north-south direction by the Pacific Motorway and the railway line. Upstream of the Pacific Motorway the catchment is predominantly agricultural and forested land. The area downstream of the Pacific Motorway is significantly developed and this part of the catchment is a mixture of urban (including a golf course) and forested areas. The Yelgun Creek catchment is linked to the Marshalls Creek catchment at north Ocean Shores via culverts underneath Kallaroo Circuit (2).

d. **Simpsons Creek (South Arm).** Simpsons Creek drains the Southern portion of the Shire excluding the two smaller catchments surrounding Byron Bay and Suffolk Park. Simpson Creek is characterised by an escarpment that runs North South and low-lying coastal swamps.

e. **Durrumbul Catchment.** Durrumbul Catchment includes the upper reaches of the Brunswick River, including Upper Main Arm. Although there is little settlement along this stretch of the Brunswick River, the impact of rainfall within the Durrumbul Catchment will impact downstream settlements within the Brunswick River catchment, mainly the towns of Mullumbimby and Brunswick Heads.

f. **Floodplains. There are three main floodplains that exist in the Brunswick Valley Catchment. These include:**

- Brunswick Valley Floodplain
- Mullumbimby Floodplain
- Marshalls Creek Floodplain

g. **Brunswick Valley Floodplain.** The Brunswick Valley Floodplain encompasses the low-lying areas that border the Brunswick River or its tributaries. This includes the towns and areas surrounding the Mullumbimby and Marshall Creek Floodplain, as well as Brunswick Heads.

h. **Mullumbimby Floodplain.** Mullumbimby Floodplain is traversed by many tributaries of the Brunswick River. The confluence of Mullumbimby Creek and Brunswick River is in the centre of Mullumbimby town, which constitutes the main area of the floodplain.

i. **Marshalls Creek Floodplain.** Marshalls Creek Floodplain extends from Lacks Creek and Marshalls Creek in the western part of the Shire to the confluence of Marshalls Creek and the Brunswick River. This includes the towns of:

i. Billinudgel

ii. Ocean Shores

iii. Ocean Shores North

iv. South Golden Beach

v. New Brighton

RICHMOND RIVER BASIN

a. **The Richmond River Basin is comprised of three distinct areas:**

- The Wilsons River Catchment and its tributaries (including Beatties Creek,
- Coorabell Creek, Opossum Creek, Stony Creek).
- Byron Creek Catchment and its tributaries (Tinderbox Creek, Paddy's Creek Maori Creek).

The Wilsons River Catchment

b. The Wilsons River Catchment starts in the north-west of the Byron Council Shire flowing to the south-east towards Federal then flowing to the south/south-east towards the Ballina Council Shire.

The Byron Creek Catchment

c. Byron Creek Catchment is a 4,500 hectare (45 km^2) sub-catchment to the Wilsons River Catchment. Byron Creek, a tributary of Wilsons River, drains from the escarpment above Suffolk Park, in a westerly direction through the town of Bangalow to the confluence with Wilsons River near Lismore. Two ephemeral creeks (Maori and Paddy) feed into Byron Creek close to Bangalow (2).

BYRON COASTAL CREEKS

Belongil Creek Catchment

a. **Belongil Creek Catchment.** Belongil Creek catchment is approximately 3,030 hectares (30.3 km^2) and is isolated from all the other catchment areas. There is a complex drainage system within the Belongil Creek Floodplain that was built to support agriculture, and which impacts on the drainage regime within the floodplain and catchment. A few small drainage channels begin at the escarpment West of Byron Bay and flow to the Northeast of Byron Bay before exiting through Belongil spit via the complex drainage network.

b. Cumbebin Swamp (187 hectares) and Belongil Swamp (168 hectares) are low-lying barrier estuarine wetlands contained within the Belongil Creek catchment (2).

c. The main automatic river level gauges monitored by BoM are the Billinudgel Gauge (202400 - 558020) which is measured at -0.019 m AHD and the Mullumbimby Gauge (202402 - 558006) which is measured at -0.010 m AHD.

Tallow Creek Catchment

d. Tallow Creek Catchment is relatively small compared to other catchments surrounding the Brunswick River Catchment (approximately 650 hectares). Tallow Creek begins from the escarpment to the west of Suffolk Park and drains through the town to the Pacific Ocean. It traverses the Tallow Creek Floodplain and includes the suburb of Suffolk Park and the neighbouring communities of Baywood Chase and Byron Hills (2).

1.3 STORAGE DAMS

a. There are no prescribed dams in the Byron Shire LGA

1.4 WEATHER SYSTEMS AND FLOODING

a. Flooding on the Far North Coast of NSW shows strong seasonality with the majority of recorded floods having occurred between February and September. This seasonality of flooding is the result of two distinct weather patterns; ex-tropical cyclones and intense depressions (east coast low pressure systems) close to the coast.

b. In the early months of the year tropical cyclones originating in the Coral Sea may move south. While it is rare for a cyclone to enter northeast New South Wales, there have been occasions when the path of a cyclone has produced rains of duration and intensity to produce a flood in the river catchments.

c. Australian Government Bureau of Meteorology analysis of the Far North Coast catchments suggests the most potent cause of flood rain events is the development of intense depressions close to the coast. These systems form either off Southern Queensland or northern New South Wales in a trough extending from the Coral Sea or from a shallow system contained within an inland Queensland trough of low pressure. Generally, these systems maintain a supply of deep moisture as they move southwards in proximity to the coast.

d. Depressions may develop at any time but flood rain events are most likely during the part of the year when sea surface temperatures are high and the air is humid. As tropical cyclones can also be expected at this time, most flood events in the Brunswick Valley catchment occur in the first half of the year with a peak period from February to April.

e. The rainfall patterns are dependent on the weather patterns occurring through the year. Flooding is more prevalent in years of La Niña, when the rainfall is significantly greater than the mean average rainfall, for example the 1954-56 La Niña, had the majority of rain falling during **February** (2)**.**

f. The figures below show the monthly distribution of historical floods at select gauges within the Byron Shire.

Figure 1, Monthly Flood Distribution, Billinudgel Gauge (202400-558020)

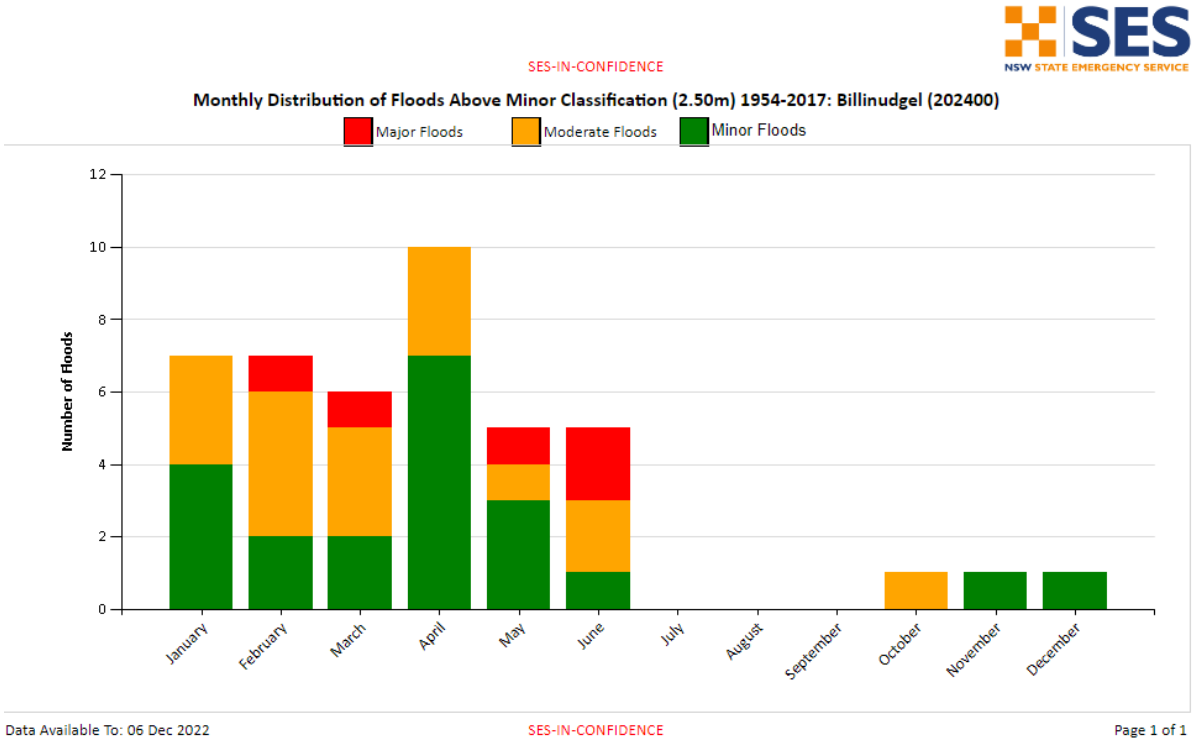
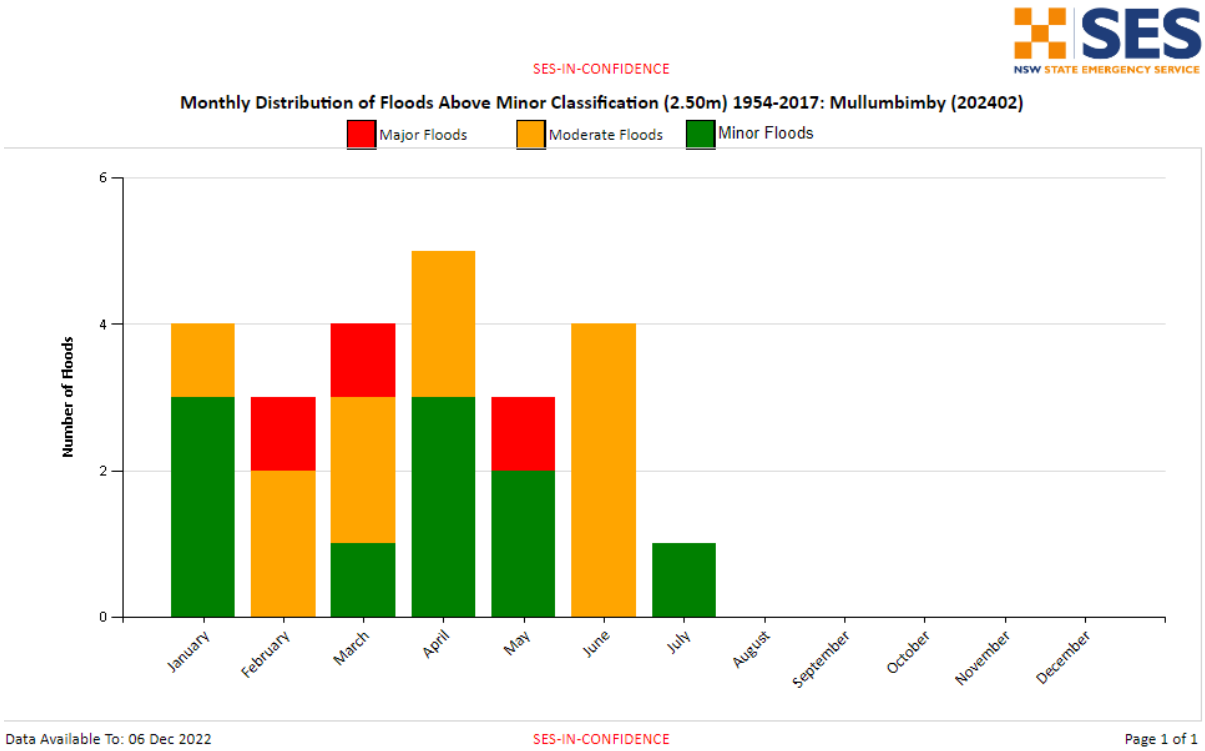


Figure 2, Monthly Flood Distribution, Mullumbimby Gauge (202402 – 558006)



1.5 CHARACTERISTICS OF FLOODING

Refer to Annex 1 – Brunswick River Basin Schematic

BRUNSWICK RIVER BASIN

1.5.1 Brunswick River Basin

a. Brunswick Catchment is characterised by wide floodplains for much of the river system. Upstream of Mullumbimby, the Brunswick River runs parallel to Main Arm Road and crosses several subsidiary roads. It also crosses Main Arm Road, once just downstream of Main Arm township at Williams Bridge and another time at Durrumbul (Sherry's Bridge). Water overtops Main Arm Road in major flood events. The town of Mullumbimby is located on the junction of the Brunswick River and Mullumbimby Creek. Near Mullumbimby there is a complex interaction of the various rivers and creeks. In larger flood events some of the water from Mullumbimby Creek enters the Brunswick River, but much of the water flows to Kings Creek and Saltwater Creek. This water then flows through the openings in the railway line south of Mullumbimby and enters the Brunswick River through Kings Creek.

b. Downstream of Mullumbimby the floodplain of the Brunswick River is relatively large. The flow passes under the Pacific Motorway, before the confluence of the Marshalls Creek and Simpsons Creek, both of which join Brunswick River very close to the ocean outlet. This interaction of three waterways also leads to complex flows in the vicinity of Brunswick Heads. There are a number of rock walls and jetties which train the flows in this area. At the Brunswick River mouth, the river is within the rock walls built in the 1960s (4).

c. Generally, the rise and fall of floods within the floodplains of the Brunswick Valley are relatively short (24-48 hours) compared to inland floods (2).

Table 1: Indicative Flow Travel Time for the Brunswick River (2)

Locations	Travel Time
Durrumbul to Mullumbimby	3-4 Hours
Mullumbimby to Brunswick Heads	3-4 Hours

Table 2: Indicative Flow Travel Time for Marshalls Creek (2)

Locations	Travel Time
The Pocket to Billinudgel	1-2 Hours

Note that these times are only estimates and may vary considerably, particularly during extreme events.

Figure 3, Design Flood Levels at Mullumbimby Gauge (202402 - 558006) (4)

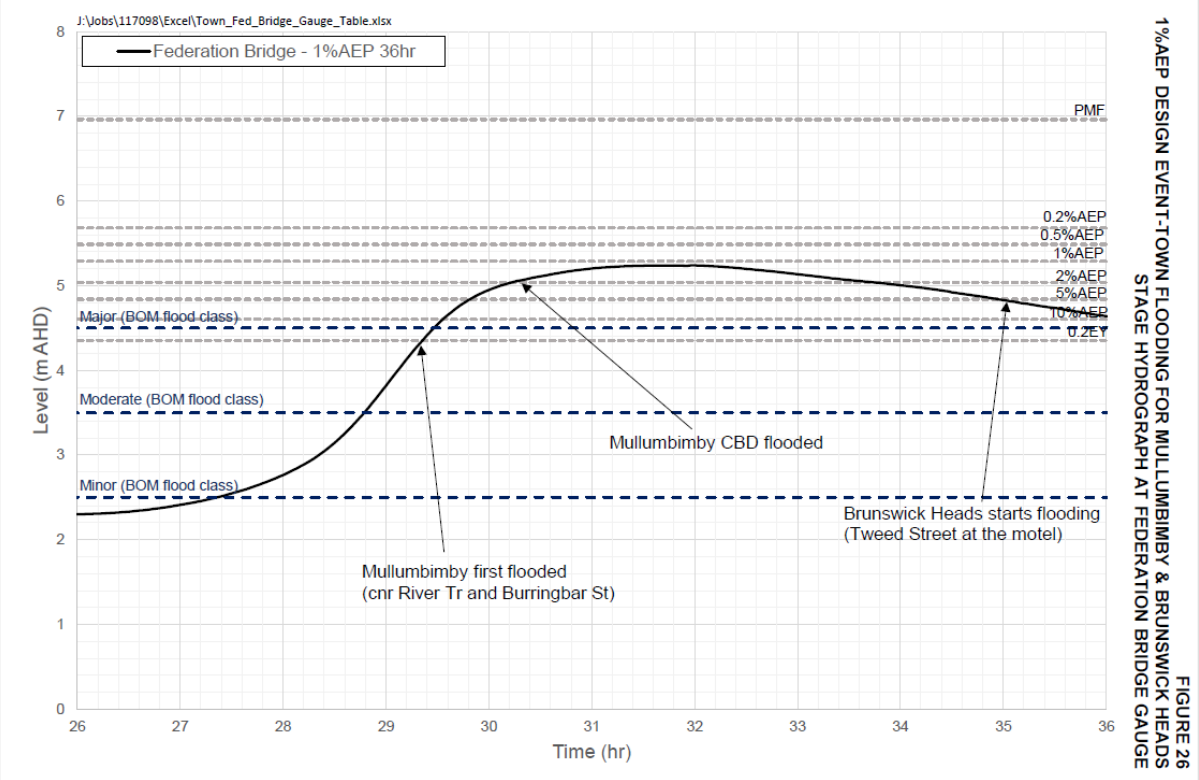
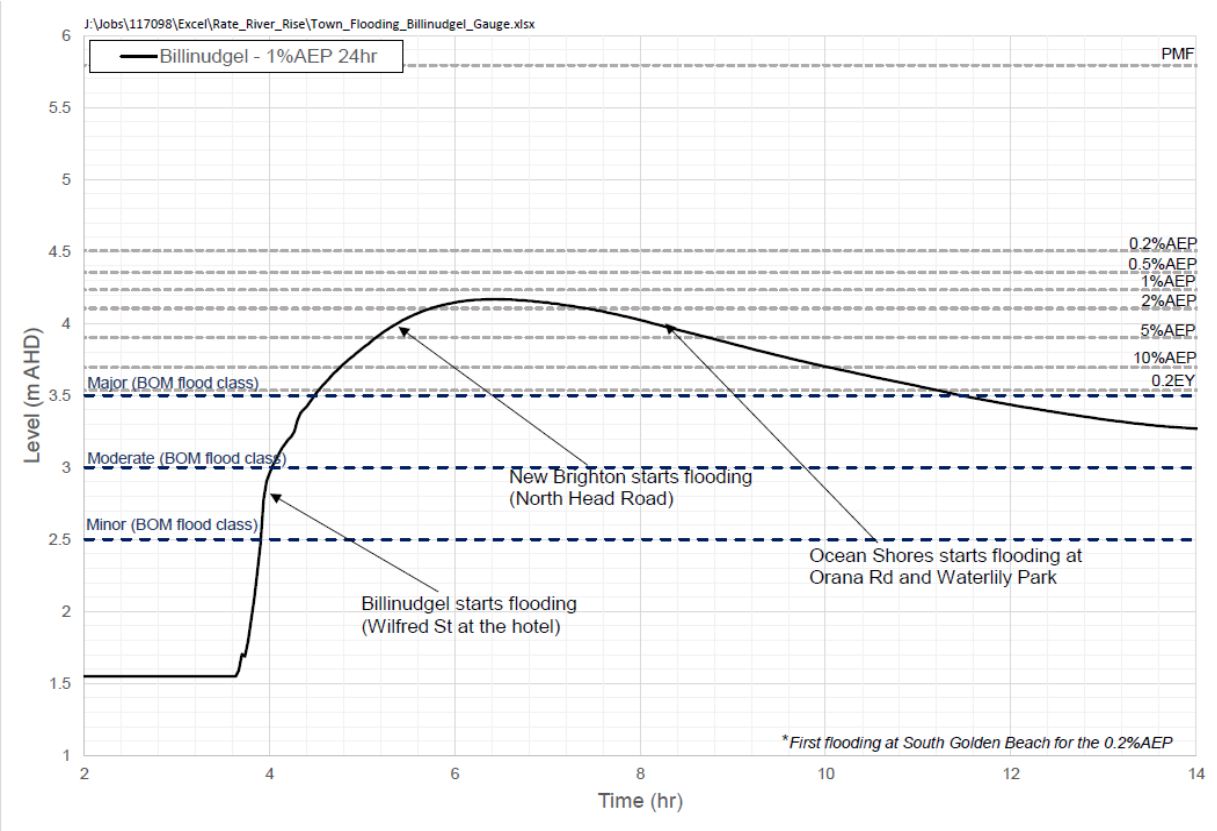


Figure 4 Design Flood Levels at Billinudgel Gauge (202400-558020) (4)



1.5.2 Marshalls Creek

f. This creek system is characterised by a complicated interaction between the Yelgun, Mooball and Marshalls Creeks. Downstream of the Pacific Motorway the Yelgun Creek floodplain is relatively large. Flows north of Kallaroo Circuit pass through a west-east bund commonly known as the Kallaroo Circuit bund. There are two culverts in the bund. This bund was surveyed in detail during the Tweed Byron Coastal Creeks Flood Study in 2010. At this point floodwaters either flow north into Mooball Creek or south under Kallaroo Circuit and into Marshalls Creek. The flood behaviour across Kallaroo Circuit has changed considerably over the years due to development:

   i. During the May 1987 flood, the canal was unobstructed.

   ii. During the June 2005 flood the canal was partially blocked by a bund with two small pipe culverts for cross-drainage (two 900mm pipes); and

   iii. During the January 2012 event, and as per current situation, an additional set of box culverts (three rectangular culverts 4.8m wide by 1.5m high) has been inserted.

g. As such, the historical flood conditions cannot be directly compared with each other and to the design events in this area. Depending on the relative flood levels, flow between Mooball Creek and Marshalls Creek occurs in either direction and can change during a single flood event.

h. Lacks Creek and Marshalls Creek converge upstream of Billinudgel. The floodplain significantly increases in size at the confluence of the creeks. The flow then passes under the railway line before passing through the Pacific Motorway bridges. Downstream of the Pacific Motorway the floodplain is also large, with water backing up into the golf course area.

i. At Strand Avenue in New Brighton, flows pass under the Orana Bridge opening, with flow occurring across Strand Avenue in the vicinity of North Head Road in larger events. Downstream of Strand Avenue the floodplain is bounded by the coastal dune and the high ground to the west. Here, the waterway is approximately 450m wide during a large flood.

j. The entrance to Marshalls Creek is trained by rock walls with two openings. The eastern opening is 42m wide, with a low level rock wall (ranging between 0.2m AHD and 0.4m AHD) to the north and therefore doesn't function as an entrance except during infrequent large flood events. For comparison, the 20% Annual Exceedance Probability (AEP) peak flood level is 1.03m AHD at the upstream face of the low-level rock wall. The western opening is 37m wide and is the only free flowing entrance to Marshalls Creek (5).

1.5.3 Simpsons Creek

i. The flooding behaviour in Simpsons Creek is less complex than the Brunswick River and Marshalls Creek catchments described previously. A number of smaller tributaries join together in the vicinity of Tyagarah. This floodplain is then constrained to a width

of approximately 250m by a high ridge (Anderson's Ridge) along which Tandys Lane runs. North of this ridge the floodplain widens again, where there are large low-lying areas to the east and west of the creek. The creek flows northward for approximately 4km to the confluence with the Brunswick River described above (5).

1.5.4 Durrumbul Catchment

j. Durrumbul Catchment includes the upper reaches of the Brunswick River, including Upper Main Arm. Although there is little settlement along this stretch of the Brunswick River, the impact of rainfall within the Durrumbul Catchment will impact downstream settlements within the Brunswick River catchment, mainly the town of Mullumbimby and Brunswick Heads (2).

RICHMOND RIVER BASIN

1.5.5 The Wilsons River Catchment

a. The Wilsons River Catchment starts in the north-west of the Byron Council Shire flowing to the south-east towards Federal then flowing to the south/south-east towards the Lismore City Council.
b. It may experience local catchment flooding if there is rainfall over the catchment or the Wilsons River is in flood.

1.5.6 Byron Creek Catchment

c. Byron Creek Catchment is a 4,500 hectare (45 km2) sub-catchment to the Wilsons River Catchment. Byron Creek, a tributary of Wilsons River, drains from the escarpment above of Suffolk Park, in a westerly direction through the town of Bangalow to the confluence with Wilsons River near Nashua. Two ephemeral creeks (Maori and Paddy) feed into Byron Creek close to Bangalow.
Historical flooding has occurred along Byron Creek through Bangalow, Binna Burra and Nashua and the area may experience riverine and overland flooding during high rainfall.

Table 3: Flood Design Heights (4)

Predicted Flood Frequency	Mullumbimby Gauge Height (m AHD)	Billinudgel Gauge Height (m AHD)
50% AEP	4.38	3.53
10% AEP	4.6	3.7
5% AEP	4.81	3.9
2% AEP	5.02	4.1
1% AEP	5.24	4.23
0.5% AEP	5.44	4.37
0.2% AEP	5.64	4.5

PMF	7.0	5.8

BYRON COASTAL CREEKS

1.5.7 Belongil Creek Catchment

a. Belongil Creek is approximately 3km long and has a catchment of around 30km^2. The township of Byron Bay is situated toward the eastern boundary of the catchment with most of the development on higher ground. The transport of catchment runoff to the estuary is influenced by numerous man-made drains and infrastructure. These include the Union Drain, the Byron Bay town drain (or Butler Street Drain), the North Coast Railway line, Ewingsdale Road and numerous bridges and culverts. Parts of the catchment area have undergone urban development, but over one-third of the catchment area is covered by Cumbebin Swamp. Large areas of swamp near the town have been reclaimed and developed, reducing the storage within the catchment. Despite this, significant portions of the catchment area are below 2m (AHD) (6). Flood levels are influenced by the conditions at the river mouth which can be opened or closed by a sandbar. Belongil Creek is an ICOLL.

1.5.8 Tallow Creek Catchment

a. The current flooding characteristics in the Tallow Creek catchment vary across the catchment. Flooding from local stormwater runoff and drainage network surcharge is the dominant flooding mechanism along Tallow Creek upstream of Suffolk Park Lake and North Tallow Creek upstream of Broken Head Road. In the lower catchment downstream of Broken Head Road, flooding is dominated by storm tide levels and is also governed by Tallow Lake entrance conditions (7).

b. Flood levels are influenced by the conditions at the river mouth which can be opened or closed by a sandbar. Tallow Creek is an ICOLL.

1.6 FLOOD HISTORY

a. **Brunswick River (Main Arm).** Spasmodic flood height recording has occurred at Mullumbimby since 1954, and the town has experienced several major floods during its history.

   i. **2022 Flood**. During the February/March 2022 flood event, very high rainfalls were experienced on the east coast of NSW particularly in the Northern Rivers region from the Tweed River to the Clarence River. The high rainfall was generated by a high-pressure system in the Tasman Sea in conjunction with a slow-moving trough and upper atmospheric support. Mullumbimby (Fairview Farm) 58040 recorded a total of 520.0mm on 28 February, which exceeded the previous record of 359.0mm on 2 February 2001 over a 124-year monitoring

period (8). The peak height recorded at the Mullumbimby gauge (202402 - 558006) was 3.64m AHD whilst the Billinudgel gauge (202400 - 558020) recorded 3.20m AHD.

ii. The Byron Shire experienced flash flooding through the coastal creeks in the north of the Shire as well as significant riverine flooding and landslips which continued after the flooding had subsided. Within the Shire, approximately 1600 properties were inundated with hundreds of additional properties within the flood extent but positioned above the peak flood level.

iii. Mullumbimby experienced significant flooding. The impacts were exacerbated by a lack of telecommunications and electricity services preventing some flood warnings from being issued. Damage was seen in the CBD and in a number of residential areas and also impacted the town water supply.

iv. The hinterland areas around Byron experienced a significant number of landslips which were driven in part by the volume of rain falling on these areas. Landslips resulted in the isolation of 192 properties and the key public and private access routes being cut hampered the ability for some in the area to recover from the event.

v. Byron Bay experienced additional flooding in late March with a number of businesses inundated in central Byron Bay – areas largely not impacted in the previous February/March flood (9).

vi. **The 2017 Flood**. The 2017 flood in Mullumbimby reached 3.64m AHD on the Mullumbimby Gauge with moderate flooding. During this event the main street into Mullumbimby, Argyle Street was flooded for a stretch of approximately 700m on the eastern side of town. Properties experienced over-floor flooding on the east, north, and southwestern parts of town. The Billinudgel gauge recorded a peak height of 4.45m AHD.

vii. Flooding is often associated with significant landslips in the area.

b. **Marshalls Creek (North Arm).** The Marshalls Creek System has flooded a number of times in recent years. The 1987 flood at Billinudgel was close to a 1% AEP event on the upper reaches of the system. However, at the junction of Marshalls Creek and the Brunswick River where flooding is heavily influenced by sea levels, the peak coincided with a low tide and only a 5% AEP flood was experienced (2).

i. **2022 Flood.** At the junction of Marshalls Creek and the Brunswick River, Golden Beach, Ocean Shores and New Brighton experienced major flooding where the smaller local catchments runoff response to rainfall was much faster than the large river systems in the region (9).

ii. **2005 Flood.** During the June 2005 flood, waters to backed up north of the Kallaroo Circuit bund and cut through urban areas to the east at Fern Beach and

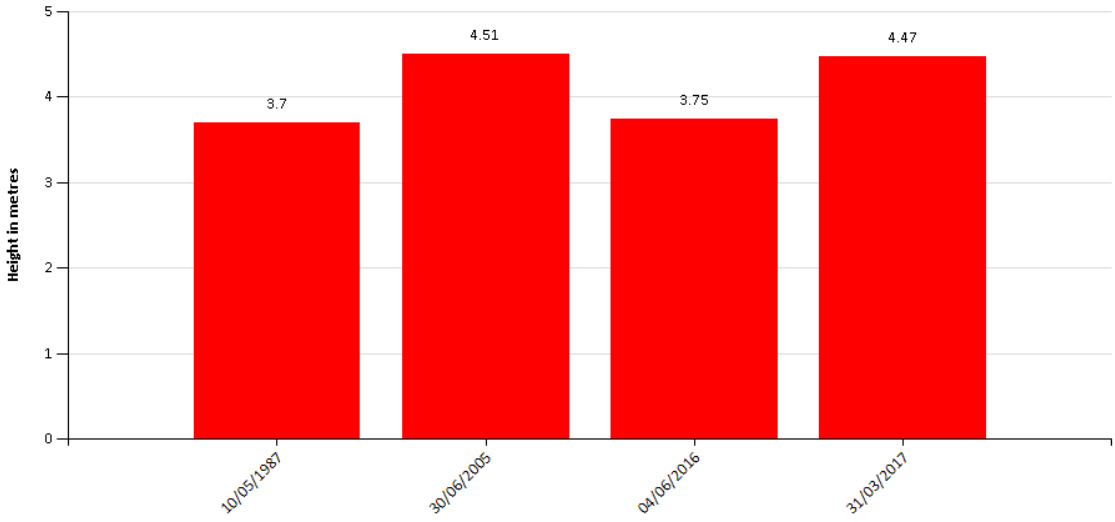
overland flow flooded South Golden Beach. Since then, additional culverts have been constructed to help address. Various bunds at North Ocean Shores affect the hydraulic interaction of Yelgun, Mooball and Marshalls creeks floodwaters. (4).

iii. **1987 Flood.** The 1987 flood was a significant flood for Mullumbimby (2).

Figure 5 Flood History for the Billinudgel Gauge (202400-558020) Floods above Major (3.5m)

SES-IN-CONFIDENCE

Floods Above Major Classification (3.50m) 1954-2017: Billinudgel (202400)



*Disclaimer: Showing the top 4 out of 4 Major Floods (based on height)

Data Available To: 06 Dec 2022

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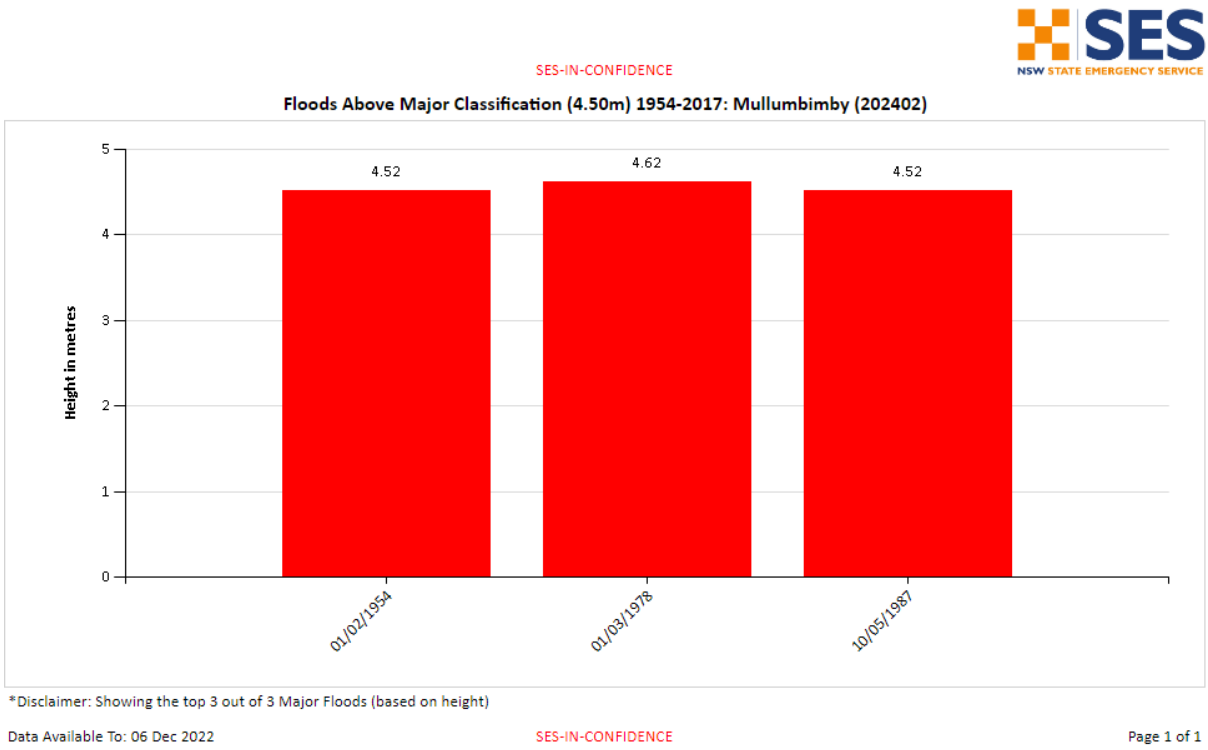
Page 1 of 1

Figure 6 Flood History for the Mullumbimby Gauge (202402 - 558006) Floods above Major (4.5m)



1.7 FLOOD MITIGATION SYSTEMS

a. There is one levee within the Byron Shire LGA:

   i. South Golden Beach Levee located at South Golden Beach and northern Ocean Shores as depicted in Map 7. (2)

b. This levee is further described within Part 2 – Specific Risk Areas.

c. Levee locations are shown on Map 7 Greater Ocean Shores

d. There is a detention basin near Coogera Court which has a design standard of 20% AEP and no formal overflow provision (7).

e. There is one flood pump behind the South Golden Beach levee which reduces flooding behind the South Golden Beach Bund.

f. There is an existing Flood Warning Network that covers the northern part of the Byron Shire and the Belongil and Tallow catchments. This system is provided by a third-party consultant managed by Council, and various alert triggers are set up and overseen by Council and will be shared with SES if an event is forecasted.

g. Council is currently working with NSW Public Works to implement a staged upgrade to their existing Flood Warning Network from ALERT to ALERT 2. It is not operational at this point but will form part of an ongoing project to prepare the system for further expansion. The proposed 11 sites and their related priority is illustrated in the below (10).

Sites to be upgraded with new or replacement ALERT2 compatible equipment		
Description		**Priority**
Upgrade	5 x Existing sites to Alert 2 Canisters at • • Mullumbimby Creek (U1) • • Sherry's Bridge (U2) • • Marshall's Creek (U3) • • Lacks Creek (U4) • • Helen Street Bridge (U5)	1
New installation	Rain gauge within Main Arm (N1)	2
Radar WL Site at Kings Creek (N2)		3
Radar WL Site at Old Brunswick Heads Highway Bridge (N3)		4
WL Site around Shell Servo at Suffolk Park (N4)		5
WL Site at Water Lilly Park, Ocean Shores (N5)		6
Gas Purge WL Site at Coral Ave, Mullumbimby Showgrounds (N6)		7

1.8 EXTREME FLOODING

a. In the Billinudgel and Greater Ocean Shores Sectors, the Probable Maximum Flood (PMF) height for the Billinudgel Gauge is estimated to be 5.8m AHD (4). This would cause severe flooding in Billinudgel, South Golden Beach, northern Ocean Shores and New Brighton.

b. In Mullumbimby and Brunswick Heads Sectors the PMF height for the Mullumbimby Gauge is 7m AHD (4). This would cause severe flooding in Mullumbimby and the majority of Brunswick Heads.

1.9 COASTAL EROSION

a. The Byron Shire coast is susceptible to coastal erosion/inundation from wave action due to large storms.

b. The following locations have property at risk of coastal erosion and are shown on Map 2 Byron Bay Town Map and Map 6 Greater Ocean Shores Town Map

   i. New Brighton and South Golden Beach

   ii. Belongil Spit

   iii. Byron Bay and

   iv. Tallow Beach/Broken Head

New Brighton and South Golden Beach

c. **New Brighton and South Golden Beach (& Brunswick Heads).** Residential development at New Brighton and South Golden Beach is located within 50 metres of the erosion escarpment. The dunes are low and 'flimsy' and past ocean breakthroughs to Marshalls Creek at New Brighton highlight the erosion threat posed to houses. A storm in July 1999 caused erosion scarps of 2-3 metres along New Brighton to South Golden Beach. Beach access paths were damaged and subsequently closed.

d. In New Brighton there are 12 homes located within 20 metres of the erosion escarpment. In past times, houses have been lost to erosion in New Brighton and the village of Sheltering Palms slightly south of New Brighton was completely destroyed by coastal erosion.

e. Development at South Golden Beach is 50m from the erosion escarpment (PWD, 1978. Byron Bay-Hastings Point Study) (2).

Belongil Spit

f. **Belongil Spit.** On Belongil Spit there are approximately 20 houses within the immediate impact zone (20 metres landward of the erosion escarpment) which may be damaged or lost during a storm event. Over half of these houses have nominal protection works (dumped rock, building rubble or geotextile bags) seaward of the houses. House sites not protected by these works would experience normal sandy beach erosion along the dune escarpment plus the down drift influence from the protection works. The May 1999 storm demonstrated the reality of the erosion threat posed to houses at Belongil. Sand was removed from the beach and erosion and collapse of the dune escarpment occurred over a 150-metre length north of Manfred Street.

g. The resort First Sun Caravan Park is located within 20 metres of the erosion escarpment (2).

Byron Bay

h. **Byron Bay.** Evidence exists of the sea breaking through the dunes at Jonson St, Byron Bay, in 1954. This caused flooding on the leeward side of the dunes. Waves also broke over the dunes and caused flooding in the CBD. At Byron Bay the May 1999 storm eroded the dune face seaward of the Byron Bay Surf Club.

i. Clarks Beach Caravan Park on Main Beach is threatened. The park is located on the edge of Main Beach, Byron Bay and will be affected by severe coastal erosion and large storm surges. (2)

Tallow Beach and Broken Head

j. **Tallow Beach/Broken Head.** In this beach unit an undeveloped buffer zone exists seaward of infrastructure and development that can accommodate short term coastal erosion impacts. The Byron Shire Coastline Hazard Definition Study (WBM Oceanics,

2000) estimates shoreline recession for this unit at 0.1 m per year with 0.3m per year in the southern hook at Broken Head. If this recession is realised then sections of Suffolk Park community may come under coastal erosion threat in 50-100 years.

k. Arrangements for the emergency management of coastal erosion/inundation are set out in Volume 3 (2).

2 EFFECTS ON THE COMMUNITY

2.1 COMMUNITY PROFILE

a. The Byron Shire Local Government Area is made up of a number of communities that can be affected in a flood. These can be classified in the following sectors:

1. **Byron Bay Sector** – Byron Bay, Ewingsdale, Suffolk Park, Broken Head, Newrybar, Coopers Shoot, Hayters Hill, Talofa and Skinners Shoot.

2. **Bangalow Sector** – Bangalow, Binna Burra, Nashua, Booyong, Clunes (East), Eureka, Possum Creek, Federal, Mcleods Shoot, Coorabell, Goonengerry, Upper Wilsons Creek, Huonbrook, Wanganui

3. **Billinudgel Sector** – Billinudgel, The Pocket, Middle Pocket, Yelgun

4. **Mullumbimby Sector** – Mullumbimby, Brunswick Heads, Myocum, Montecollum, Wilsons Creek, Mullumbimby Creek, Koonyum Range, Main Arm, Palmwoods, Tyagarah, Upper Main Arm

5. **Greater Ocean Shores Sector** – Ocean Shores, New Brighton, South Golden Beach

b. The 2021 Census recorded 36,116 people residing in the Byron Shire Local Government Area. Table 4 provides an overview and breakdown of the Byron Shire community.

c. Over 18% of the population is 65 or older, which can cause problems if a quick evacuation is required. People over 65 are more likely to need assistance in evacuations. Some elderly people may also be socially isolated, resulting in them being unaware of evacuation warnings or unable to decide on a course of action. Areas with particularly high proportions of elderly residents should be targeted for doorknocking and the provision of transport.

d. There are many single-parent families in the Byron Shire. Single-parent families are often characterised by low adult-children ratios, which makes evacuation more difficult. Areas with particularly high proportions of single parent families should be targeted in doorknocking and for the provision of transport.

e. The Byron Shire is a significant tourist area and has many backpackers and overseas visitors at any one time. Potential problems can occur during emergency arrangements if travellers are unaware of the risks of an area, and the strategies put in place to deal with these emergencies (2). The number of tourists visiting the Byron Shire is significant with approximately two million visitors arriving annually.

f. Of note, there are a significant number of people living off the grid in multiple occupancy dwellings in the hinterland above Mullumbimby. Accurate statistics

for the number of people and dwellings are not held and it is likely that telecommunications may be limited.

g. There are also a number of homeless and homeless camps in the floodplain which are at significant risk.

Table 4: Census of Housing and Population data (2021) (1)

Census Description	LGA	Byron Bay	Suffolk Park	Bangalow	Billinudgel
Total Persons	**36116**	**10538**	**4222**	**2260**	**261**
Aged 0-4 years	1733	452	226	176	16
Aged 5-14 years	4084	971	484	366	32
Aged 65 + years	6699	1800	648	351	41
Of Indigenous Origin	685	199	67	41	5
Who do not speak English well	12	11	9	0	0
Have a need for assistance (profound/severe disability)	1490	182	158	121	14
Living alone (Total)	3439		136	143	17
Living alone (Aged 65+)	1506	457	132	62	6
Residing in caravans, cabins or houseboats or improvised dwellings	418	170	17	0	0
Occupied Private Dwellings (Households)	**12875**	**3821**	**1463**	**758**	**69**
No Motor Vehicle	418	204	43	9	0
Caravan, cabin, houseboat or improvised dwell	280	127	19	0	0
Rented via State or Housing Authority	90	53	4	5	0
Rented via Housing Co-Op or Community Church Group	151	83	11	3	0
Unoccupied Private Dwellings	**2348**	**1189**	**186**	**70**	**12**
Average persons per occupied dwelling	**2.5**	**2.4**	**2.6**	**2.7**	**2.7**
Average vehicles per occupied dwelling	**2**	**1.8**	**2**	**2**	**2.2**

Census Description	Mullumbimby	Brunswick Heads	South Golden Beach	New Brighton	Ocean Shores
Total Persons	**3589**	**1686**	**2219**	**368**	**4818**
Aged 0-4 years	171	75	106	29	262
Aged 5-14 years	502	140	331	33	515

Aged 65 + years	693	399	316	85	880
Of Indigenous Origin	64	36	62	4	130
Who do not speak English well	0	0	0	0	0
Have a need for assistance (profound/severe disability)	168	100	86	14	212
Living alone (Total)	377	265	174	31	508
Living alone (Aged 65+)	187	132	41	9	240
Residing in caravans, cabins or houseboats or improvised dwellings	7	86	0	4	4
Occupied Private Dwellings (Households)	**1353**	**719**	**799**	**130**	**1855**
No Motor Vehicle	66	43	9	0	56
Caravan, cabin, houseboat or improvised dwell	3	55	0	0	0
Rented via State or Housing Authority	0	13	0	0	0
Rented via Housing Co-Op or Community Church Group	0	18	0	0	0
Unoccupied Private Dwellings	**109**	**160**	**119**	**73**	**199**
Average persons per occupied dwelling	**2.4**	**2.1**	**2.6**	**2.4**	**2.4**
Average vehicles per occupied dwelling	**1.8**	**1.7**	**1.9**	**2**	**1.9**

SPECIFIC RISK AREAS – FLOOD

Byron Coastal Creeks

2.2 BYRON BAY

2.2.1 Community Overview

a. The Byron Bay Sector is located to the south of the Byron Shire, bordering the Mullumbimby Sector to the north-west, Bangalow Sector to the west and the Ballina Shire to the south. The main population centre of Byron Bay has a population of 10538 people living in 3821 dwellings with an indigenous population of 1.9%. Suffolk Park has a population of 4222 people living in 1463 dwellings and an indigenous population of 1.6% (1).

2.2.2 Characteristics of flooding

a. The Byron Bay township is susceptible to flooding from both intense short duration storms over the town catchment and elevated ocean levels. The Belongil Creek entrance condition can directly affect flood levels in the western part of town. The lowest portions of the township are below 2m AHD and elevated ocean conditions can rise to this level under cyclonic conditions. There is no direct overland escape route for flood waters in the township, which is separated from the estuary by the North Coast Railway line. The town centre is drained to the estuary via the town drain, which receives water from the Byron Street drains under the railway line. The capacity of this drain is limited by a lack of hydraulic gradient between the low-lying township and the Belongil Creek outlet. The Byron Bay township drainage system has an estimated capacity equivalent to less than a 100% AEP event.

b. Flooding in the township of Byron Bay, east of the railway line, is partially independent of the flooding from Belongil Creek. It is largely caused by the limited capacity of the Byron Bay storm water network which is unable to manage local stormwater runoff. Low lying properties located adjacent to the town drain are also susceptible to stormwater flooding due to their proximity to the town drain.

c. The Belongil Creek Catchment is at risk of storm tide inundation and local catchment stormwater runoff (11).

d. The Tallow Creek Catchment is at risk of local catchment stormwater runoff and coastal inundation (7).

2.2.3 Flood Behaviour

Tallow Creek Catchment

a. Flooding is generally limited to undeveloped natural waterways. Some localised flooding of upper catchment areas occurs around Coogera Court, Beech Drive and

Pepperbush Street, mainly as a result of inadequate stormwater systems. This flooding is shallow, and does not cause house flooding above floor level. Similarly, localised flooding of properties in Hazelwood Close, Suffolk Park has been observed resulting from backwater effects from the Broken Head Road wetland.

b. The catchment can be segmented into two parts with specific hydraulic characteristics. Flooding in the area upstream of Broken Head Road is typically a result of stormwater runoff exceeding drainage system capacity. Flooding in this area is unaffected by outlet conditions at the mouth of Tallow Creek. Downstream of Broken Head Road flooding is more strongly influenced by the condition of the opening of the Creek mouth. Flooding is characterised by inundation from Tallow Creek itself, and from the associated wetland areas. Broken Head Road, the primary access and egress for the area and a secondary access to Byron Bay, has a very low flood immunity at the crossing of South Tallow Creek. Overtopping of the road by South Tallow Creek flood flows is estimated to occur in flood events equivalent to approximately 20% AEP (7).

Belongil Creek Catchment

a. Parts of the catchment area have undergone urban development, but over one-third of the catchment area is covered by Cumbebin Swamp. Large areas of swamp near the town have been reclaimed and developed, reducing the storage within the catchment. Despite this, significant portions of the catchment area are below 2m AHD. Areas of the catchment most vulnerable to flooding are located along the estuary outlet in the north of the catchment and on the eastern side of the catchment in the Byron Bay township and adjoining areas. These areas are impacted by high ocean elevations in combination with high flood flows from the estuary. Intermittent closure of the creek outlet through sand buildup can also exacerbate flood levels throughout the catchment under heavy rainfall. However, closure of the creek may reduce ocean induced flooding during times of elevated ocean levels.

b. The lowest portions of the township are below 2.0 m AHD and elevated ocean conditions can rise to this level under cyclonic conditions. There is no direct overland escape route for flood waters in the township, which is separated from the estuary by the railway line. The town centre is drained to the estuary via the town drain, which receives water from the Byron Street drains under the railway line. The capacity of this drain is limited by a lack of hydraulic gradient between the low-lying township and the Belongil Creek outlet. A separate study has found that the Byron Bay township drainage system has a capacity equivalent to less than a 100% AEP flood. Low lying properties located adjacent to the town drain, are also susceptible to flooding due to the limited capacity of the town drain, and the proximity to the ocean.

c. In the 1% AEP flood event, the peak flood level in the Cumbebin Swamp reached 2.56 m AHD, approximately 0.25 m lower than the peak ocean level. Properties adjoining Belongil Creek, north of the railway line, are within a high hazard zone from both

coastal hazard and flood hazard. Under the high velocities encountered along the creek, there is also a very high stream bank erosion risk for properties adjoining the creek, north of the Railway Line Bridge.

d. Properties adjacent to the north side Byron Street town drain reserve (west of the Town Centre) are currently inundated in the 1% AEP flood. Properties near Kendall Street are in a high hazard flood zone under 1% AEP conditions. In the Probable Maximum Flood, the high hazard region covers properties in Kendall Street, Dryden Street, Milton Street, Wordsworth Street and Shirley Street.

e. In the 1% AEP flood, flood levels in the Byron Bay Town Centre at Lawson Street, east of the railway line are approximately 0.15 m higher than those on the west side. The railway line remains flood free. During the Probable Maximum Flood, the railway line is overtopped near Ruskin Street and peak flood levels in the Town Centre rise to the same level as those on the west side of the railway line. The peak flood level during the PMF is approximately 3.6 m AHD through much of the township, compared to 3.8 m AHD at the ocean. This would result in 1.8 m water depth in the lowest part of Lawson Street where the surface is at approximately RL 2.0 m AHD.

f. In the Town Centre, the deepest flooding occurs in properties located within the land bounded by Lawson Street, Byron Street, Fletcher Street and Middleton Street. Under current conditions, the 1% AEP flood reached 2.71 m AHD at this location, with a maximum depth of approximately 0.5 m. This water would be slow moving and the hazard would be low. In the PMF, flood levels would reach up to 3.6 m AHD, with a depth of 1.4 m. The hazard category would be high, based on the flood depth.

g. East of the town centre, a large portion of the catchment drains to the Cowper Street piped outfall to Clarkes Beach. This outfall replaces the natural flow path toward the west to Belongil Creek which has been raised through filling for development. The limited capacity of this outfall causes significant flooding at the existing playing fields in Cowper Street as well as surrounding properties. In the flood events up to the 5% AEP event, all flow that leaves this part of the catchment flows through the ocean outfall to Clarkes Beach. In the 1% AEP flood event, flood waters reach sufficient depth that they overflow as surface flow to the west to the Belongil Creek system.

h. In the PMF, the flood level forms a level pool from the Ewingsdale Road bridge, upstream to the recreation grounds east of the Town Centre and reaches a peak flood level of 3.6 m AHD. A large portion of the Town Centre which would be classed as low hazard in the 1% AEP event would be classed as high hazard in the PMF.

i. In Middleton Street, at the low point immediately north of Marvell Street, the road would be flooded to 0.9 m depth in the 1% AEP flood. Lots to the east of Middleton Street are currently vulnerable to similar flood depths.

j. On the west side of the railway line, in the south of the floodplain, properties along Lilli Pilli Drive are flood free in the 1% AEP flood. The flood hazard category is low for properties in this area. In the PMF, properties along Lilli Pilli Drive are inundated by up to 1.0 m of water along the road reserve. The flood hazard would be high under these conditions, although the water would be slow moving. In the Industrial Estate, the 1%

AEP flood level reached 3.95 m AHD at Bayshore Drive and Brigantine Street. A number of lots in Brigantine Street, Bayshore Drive and Grevillea Street are inundated in the 1% AEP flood event. In the PMF, most flooding remains low hazard although lots are inundated in Centennial Circuit, Grevillea Street, Bayshore Drive and Brigantine Street. Low hazard flooding would also occur in Cypress Circuit, Julian Rocks Drive, Sunrise Boulevarde and Belongil Crescent. High hazard flooding would be mainly confined to the open drainage channels in the industrial estate and water overtopping Ewingsdale Road (6).

2.2.4 Classification of Floodplain

a. The Byron Bay Sector can be further broken into down into subsectors for floodplain classification, these classifications are as follows:

OBJECTID	Polygon Name	Population Estimate	Dwelling Estimate	Vehicle Estimate	Comment
44803	Byron B	15	7	13	Low Flood Island
44804	Byron Bay C	124	75	135	Rising Road Access
44811	Byron Bay F	10	19	34	High Flood Island
44812	Byron Bay G	300	372	670	High Flood Island
44814	Byron Bay H	137	147	265	Rising Road Access
44816	Byron Bay V	359	176	316	Rising Road Access
45204	Glen Villa Resort	98	83	149	Low Flood Island
45206	Byron Bay D	103	71	128	Rising Road Access
45210	Cumbebin Swamp East	58	24	43	Rising Road Access
45212	Cumbebin Swamp West	29	12	22	Overland Escape Route
45213	Cumbebin Swamp North	97	78	140	Low Flood Island
45215	Cumbebin Swamp North B	364	203	365	Overland Escape Route
45218	Byron Bay J	N/A	N/A		Rising Road Access
45220	Byron Bay K	235	112	202	Low Flood Island
45222	Byron Bay L	410	220	396	Rising Road Access
45223	Byron Bay M	195	98	176	Low Flood Island
45227	Byron Bay O	36	27	49	Low Flood Island
45228	Belongil Swamp A	13	17	31	Rising Road Access
45229	Byron Bay P	507	257	463	High Flood Island
45230	Byron Bay Q	90	44	79	High Flood Island
45236	Byron Bay U	38	32	58	High Flood Island
45237	Byron Bay R	2518	1290	2322	Indirectly Affected Area
45238	Byron Bay T	463	208	375	Rising Road Access
45605	Byron A	N/A	N/A		Rising Road Access
45607	Byron Bay S	426	198	356	Rising Road Access
46406	Suffolk Park A	991	467	840	Rising Road Access
46407	Suffolk Park B	1236	693	1247	High Flood Island
46408	Suffolk Park C	1847	724	1303	High Flood Island
46409	Suffolk Park D	56	23	41	High Flood Island

(12).

2.2.5 Inundation

Tallow Creek Catchment

a. Within the Tallow Creek Catchment area, in particular Suffolk Park, properties can begin to become inundated from the 20% AEP event.

Table 5 Estimated number of properties inundated above floor level and over ground in the Tallow Creek Catchment (7)

Design Event	No. Properties with Over floor Flooding	No. Properties with Over-ground Flooding
20% AEP	1	53
5% AEP	5	71
2% AEP	9	77
1% AEP	13	80
0.02% AEP	18	96
PMF	135	112

Belongil Creek Catchment

a. Within the Belongil Creek Catchment area, properties can begin to become inundated from the 20% AEP event.

Table 6 Estimated number of properties inundated above floor level in the Belongil Creek Catchment (11)

Design Event	No. Properties with Over floor Flooding
20% AEP	95
10% AEP	110
5% AEP	123
1% AEP	246
PMF	548

2.2.6 Isolation

a. Whilst historically the Byron Sector has not been subject to long term isolation, local and major road closures may occur at Sunrise Boulevard, Lawson Street, Paterson Lane, Butler Street, Johnson Street and Bangalow Road (south), which could cause short term isolation for a significant number of properties in the Byron township and Suffolk Park.
b. Ewingsdale Road is also known to become flooded.

2.2.7 Flood Mitigation Systems

a. There is a detention basin near Coogera Court which has a design standard of 20% AEP and no formal overflow provision (7).

b. There are also a number of flood mitigation systems are being planned to provide protection up to the 10% AEP event.

c. Council currently have approval to conduct pre-emptive beach scaping of the Tallow Creek Berm in line with the “Entrance Management Process” of the Environmental Management Plan and Opening Strategy for Tallow Creek. This can only be conducted when the berm height exceeds 2.2m AHD and 40mm+ of rain has commenced or is forecast for the next 48hrs (13).

d. Council has a license for mechanically opening Belongil Creek when deemed necessary to relieve flooding. This includes approval to undertake channel excavation of Belongil Creek at the Ewingsdale Road Bridge when the level of Belongil Creek reaches 1.1m AHD. This can only commence when forecast or actual rainfall is predicted to reach or exceed 20mm within 24hrs following the expected opening time (14).

2.2.8 Dams

a. There are no known dam consequence failures in the Byron sector.

2.2.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Byron Shire including schools, childcare centres, hospitals, aged and infirm, infrastructure and caravan parks are shown in Annex 3.

2.2.10 Other Considerations

a. Byron Bay has a large homeless population of 221 people (Byron Shire Council).

b. Byron Bay also holds a large number of annual events including Blues Fest in late March, Byron Triathlon in May, Byron Comedy Festival and Byron Musical Festival in June, Splendour in the Grass in July, Surf Festival in August, and the International Film Festival in October.

2.3 BANGALOW

Richmond River Basin

2.3.1 Community Overview

a. The Bangalow Sector is located to the west of the Byron Bay Sector and borders the Ballina Shire to the south and Lismore City to the west. The main population centre of Bangalow has a population of 2260 people living in 758 dwellings. It has an indigenous population of 2.9% (1).

b. Smaller settlement in the Bangalow Sector include Goonengerry, Federal, Upper Wilsons Creek, Huonbrook, Coorabell, Eureka and Possum Creek.

2.3.2 Characteristics of flooding

a. Historically, Bangalow has been affected by riverine flooding from the Wilsons River, Byron Creek and Paddy's Creek in 1974. (12).

2.3.3 Flood Behaviour

a. Once the Mullumbimby Gauge reaches 3.5m several multiple occupancy buildings (communes) are isolated in the Wilsons Creek area (2).

2.3.4 Classification of Floodplain

OBJECTID	Polygon Name	Population Estimate	Dwelling Estimate	Vehicle Estimate	Comment
41579	West Mullumbimby A	9	4	7	Rising Road Access

2.3.5 Inundation

a. Historically, there has been some inundation in the township of Bangalow, and the Binna Burra and Nashua areas (12).

2.3.6 Isolation

a. In Upper Wilsons Creek it is estimated that there could be up to 240 homes needing resupply in any flood situation extending beyond 2 days (15).

b. In Huonbrook there is the potential for isolation (2).

c. Other small towns may also become isolated during major flooding events due to potential road closures along Lismore Road and the Pacific Motorway.

2.3.7 Flood Mitigation Systems

a. There are no known flood mitigation systems in the Bangalow Sector

2.3.8 Dams

a. There are no known dam consequence failures in the Bangalow Sector.

2.3.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Byron Shire LGA including schools, childcare centres, hospitals, aged and infirm, infrastructure and caravan parks are shown in Annex 3.

2.3.10 Other Considerations

a. There are a significant number of people living off the grid in multiple occupancy dwellings in the Upper Wilsons Creek and Huonbrook areas (15).

2.4 BILLINUDGEL

Brunswick River Basin

2.4.1 Community Overview

a. The Billinudgel Sector is located directly west of the Pacific Motorway and primarily comprises of business and industrial land uses.

b. Billinudgel has a population of approximately 261 living in 69 dwellings as recorded in the 2021 census with an indigenous population of 1.9% (1). It is more susceptible to flooding than other areas within the Byron Shire, due to the low-lying nature of land the town is built on (2).

c. The Pocket has a population of 231 people living in 88 dwellings (1).

2.4.2 Characteristics of flooding

a. Billinudgel is subject to riverine flooding from Marshalls Creek, which is linked to levels at the Billinudgel Gauge. Flooding is variable and warning time will change with each flood event. However, there is limited time between when the Billinudgel Gauge reaches Minor, and flooding occurs along Wilfred Street at the Billinudgel Hotel (4).

2.4.3 Flood Behaviour

a. The area upstream of the railway line and the land downstream between Shara Boulevard and New Brighton Road are predicted to be inundated in a 20% AEP design flood event, with depths of up to 2.5m.
b. In a 1% AEP design flood event, the area between the railway line and the Pacific Motorway is also predicted to be inundated, although the railway line is still a hydraulic control generating a head drop of approximately 0.3m.
c. Peak flood levels are predicted to increase by more than 2m from the 1% AEP flood to the PMF event.
d. In a PMF event, most of the floodplain downstream of the Pacific Motorway and north and east of Balemo Drive is predicted to be a major flow path for the flood, with high (greater than 1 m2/s) velocity x depth product (16).

2.4.4 Classification of Floodplain

OBJECTID	Polygon Name	Population Estimate	Dwelling Estimate	Vehicle Estimate	Flood Classification
180	Billinudgel	3	2	2	Low Flood Island

2.4.5 Inundation

a. Billinudgel utilises the Billinudgel Gauge (202400-558020).

b. Billinudgel is situated in close proximity to Marshalls Creek and is at the tidal limit for the stream. Many of the village's residents begin to experience problems at moderate flood levels. The duration of flooding is influenced by tidal levels, but is typically only short.

c. In the 20% AEP event, properties in this area are inundated from Marshalls Creek.

d. By the 0.02% AEP event, most of the properties in the area are inundated. There is little change in the extent of inundation in the PMF compared to the 0.02% AEP event. (5)

e. Historically, several properties have also been inundated in The Pocket (15).

f. **Major Flood** (3.5 m and higher at the Billinudgel Gauge).

i. Water in the Wilfred Street will vary from 1.2 m to 2 m and above in depth. Businesses will have considerable water over the floor.

ii. Most residences have been raised and are likely to only experience water below floor level across their blocks. However, over floor flooding may occur in severe flooding (2).

Table 7: Estimated number of properties inundated above floor level in Billinudgel related to the Billinudgel gauge. (4)

Billinudgel Gauge Height (m AHD)	No. Properties with Over floor Flooding
3.7m (10% AEP)	2
3.9m (5% AEP)	3
4.1m (2% AEP)	3
4.23m (1% AEP)	5
4.37m (0.5% AEP)	11
4.5m (0.2% AEP)	15
5.8m (PMF)	23

2.4.6 Isolation

Billinudgel

a. Billinudgel can become isolated from the 20% AEP event with local roads being inundated (12).

b. In a Minor Flood (2.5 m to 3.0 m at Billinudgel Gauge) Wilfred Street is closed to all but 4WD vehicles and there is water over the roads in The Pocket and Middle Pocket (these areas are upstream of Billinudgel).

c. At Moderate flood level (between 3.0 to 3.5m Billinudgel gauge) Wilfred Street is closed due to water over the road and roads in Billinudgel will be inundated. The roads to The Pocket and Middle Pocket are also closed.

d. In a Major flood (3.5m at the Billinudgel gauge) Billinudgel is completely isolated.

The Pocket

a. The Pocket can become isolated from the 20% AEP event.

Table 8: Isolated houses for the full range of design flood events in the Billinudgel Sector (4)

Suburb	50% AEP	10% AEP	5% AEP	2% AEP	1% AEP	0.5% AEP	0.2% AEP	PMF	Total
Billinudgel	10	5	3	1	29	18	6	0	62
The Pocket	1	1	1	0	0	0	0	0	3
Middle Pocket	0	0	1	1	1	6	1	1	11

2.4.7 Flood Mitigation Systems

a. There are no known flood mitigation systems in the Billinudgel Sector.

2.4.8 Dams

a. There are no known dam failure consequences in the Billinudgel and The Pocket Sector.

2.4.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Byron Shire LGA including schools, childcare centres, hospitals, aged and infirm, infrastructure and caravan parks are shown in Annex 3.

2.4.9 Other Considerations

a. No other considerations have been identified.

2.5 MULLUMBIMBY

Brunswick River Basin

2.5.1 Community Overview

a. The Mullumbimby Sector borders Bangalow Sector to the south, the Billinudgel and The Pocket Sector and Greater Ocean Shores Sector to the northeast and the Tweed Shire to the north and west.

b. Mullumbimby has a population of approximately 3,589 people living in 1353 dwellings and an indigenous population of 1.7% as recorded by the 2021 census. It is located at the confluence of the Brunswick River and Mullumbimby Creek. Upstream of Mullumbimby the streams are largely incised and confined to their main channels, but at Mullumbimby and downstream there are extensive floodplains.

c. Brunswick Heads has a population of 1686 people living in 719 dwellings and an indigenous population of 2.1% as recorded by the 2021, census-augmented at holiday times by additional visitors living in 3 caravan parks, 4 motels and numerous holiday lettings. The township is at the confluence of all the streams that drain the Brunswick Valley but, with the exception of some low-lying streets on the western side of the town, it is not subject to flooding (2).

d. Main Arm has a population of 640 people living in 177 dwellings with an indigenous population of 2.1% as recorded by the 2021 census (1).

2.5.2 Characteristics of Flooding

a. Mullumbimby is subject to riverine flooding from the Brunswick River, Mullumbimby Creek and Saltwater Creek

b. Brunswick Heads is subject to riverine flooding from the Brunswick River, Marshall Creek and Simpsons Creek as well as coastal flooding.

2.5.3 Flood Behaviour

Mullumbimby

a. The Brunswick River, Mullumbimby Creek and Saltwater Creek pose a flood risk to Mullumbimby. An embankment from a disused railway line cuts through the floodplain immediately east of the town centre. This embankment traps floodwater, thereby increasing the flood risk in the town centre and reducing the flood risk to the east of the railway. In the 20% AEP event, flooding is fairly contained within the greenspace area along the riverbanks. However, flooding does occur:

i. In the northern part of the town adjacent to the southern bank of the Brunswick River and on the western side of the railway; and

ii. In southern Mullumbimby along Saltwater Creek.

b. In the 5% AEP event, properties to the east of the railway, near the Brunswick River, start to get inundated. Flooding from Saltwater Creek and Mullumbimby Creek merge and cause some properties to become isolated.

c. The extent of flooding through the town, particularly to the east of the confluence of the Brunswick River and Mullumbimby Creek, progressively gets larger. Parts of Mullumbimby become isolated, and by the 1% AEP event, much of Mullumbimby is flooded.

d. For the 0.02% AEP event only pockets of development on high ground escape flooding.

e. While flood levels increase significantly for a PMF event, the extent of flooding around Mullumbimby is not notably more extensive than that for the 0.02% AEP event (5).

Brunswick Heads

a. The Brunswick River, Marshall Creek and Simpsons Creek pose a flood risk to Brunswick Heads. During the 20% and 10% AEP events, the flooding in this area is contained within the waterways.

b. In the 5% AEP event, flooding from the Brunswick River starts inundating the town near the Boat Harbour and North Coast Holiday Parks Massey Greene.

c. By the 2% AEP event, the flooding spreads and there is property inundation as a result of both the Brunswick River and Simpsons Creek overtopping. The flooding for events beyond the 2% AEP event does not spread much further, but the floodwaters become deeper.

d. The vast majority of the town is not affected by river flooding in the 0.02% AEP event, and all of Brunswick Heads is inundated in a PMF event as the entrance is too narrow for the flood water to escape (5).

2.5.4 Classification of Floodplain

a. Mullumbimby Sector can be further broken down into subsectors for floodplain classification, these classifications are as follows:

OBJECTID	Polygon Name	Gauge Name	Gauge Height	Population Estimate	Dwelling Estimate	Vehicle Estimate	Comment
41161	Mullumbimby A	mAHD	3.5	515	232	418	Low Flood Island
41162	Mullumbimby B	mAHD	3.5	282	116	208	Low Flood Island
41163	Mullumbimby C	mAHD	3.5	125	59	106	Low Flood Island
41164	Mullumbimby D	mAHD Flash Flooding on Mullumbimby Road	3.5	974	366	658	Low Flood Island
41165	Mullumbimby E	mAHD	3.5	830	420	756	Low Flood Island
41166	Mullumbimby F	mAHD Flash Flooding	3.5	143	80	144	Rising Road Access
41167	Mullumbimby G	mAHD Flash Flooding on Mullumbimby Road	3.5	799	390	702	Low Flood Island
41168	Mullumbimby H	mAHD	4	255	100	180	High Flood Island
41181	Mullumbimby I	mAHD	3.5	91	36	65	Overland Escape Route
41182	Mullumbimby J			28	11	20	Overland Escape Route
41187	Main Arm A	mAHD due to creek flooding	3.5	87	33	59	Overland Escape Route
41188	Mullumbimby Creek A	mAHD due to creek flooding	3.5	110	48	86	Overland Escape Route
41624	South Mullumbimby A	mAHD	4	70	27	47	High Flood Island
41625	Myocum A			118	50	90	Rising Road Access
41641	Wilsons Creek A	mAHD due to creek flooding	3.5	106	45	81	Overland Escape Route
42401	Mullumbimby K			16	6	11	Overland Escape Route
46430	Mullumbimby South	mAHD Flash Flooding on Mullumbimby Road	3.5	77	41	74	Low Flood Island
46432	Mullumbimby West	mAHD	2.8	44	16	29	High Flood Island

b. Brunswick Heads is a High Flood Island

2.5.5 Inundation

a. This area utilises the Mullumbimby Gauge at Federation Bridge (202402 - 558006). There is an additional new gauge Mullumbimby Creek (558111) at Azalea St Bridge.

Mullumbimby and Wilsons Creek

a. **Minor Floods** (2.5m to 3.5m at Mullumbimby Gauge). In a minor flood no houses are inundated by water over floors. The road to Upper Main Arm above Palmwoods Junction becomes impassable.

b. Moderate Floods (3.5m to 4.5m at Mullumbimby Gauge).

i. At around 3.5m on the Mullumbimby Gauge water leaves the river vicinity of the Ross Industrial area and enters Fern Street. Main Arm Road, Left Bank Road out to Wilsons Creek and Jubilee Road (Mullumbimby Golf Course) are impassable to all vehicles. Several multiple occupancy buildings (communes) are isolated in the Upper Main Arm and the Wilsons Creek areas. Road access is lost to all but high clearance 4WD emergency vehicles. Water may start to enter Riverside Drive in Brunswick Heads.

ii. At approximately 4m on the Mullumbimby Gauge the river breaks its banks near the Mullumbimby High School and water begins to enter the school auditorium. Saltwater Creek may back up and cause water to enter Jubilee Avenue and Myocum Road near the top end of the Golf Course. This may close the road to all but high

clearance 4-wheel drive vehicles, thereby restricting access to Wilsons Creek, Myocum, and Mullumbimby Creek areas. Three homes in New City Road are likely to have over floor inundation.

iii. By around 4.4m on the Federation Bridge Gauge floodwaters have entered Heritage Park, Burringbar St and Tyagarah Street. This water combined with water backing up in Saltwater Creek results in floodwaters starting to surround the eastern part of Mullumbimby including the CBD (area bounded by Brunswick River, Manns Rd and Cedar St). Floodwater progressively fills in towards the CBD causing a shrinking island effect. Major roads into Mullumbimby are likely to be closed, as will Gulgan Road effectively isolating the town .

Brunswick Heads

a. **Minor Flood** (2.5m to 3.5m at Mullumbimby Gauge). No flood effects.

b. **Moderate Flood** (3.5m to 4.5m at Mullumbimby Gauge). Water begins to appear in Riverside Drive.

c. **Major Flood** (4.5m and greater on the Mullumbimby Gauge).

i. Homes in Riverside Drive become flooded.

ii. Water appears in the yards of homes at the Western end of Fingal Street

Table 9: Estimated number of properties inundated above floor level in Mullumbimby* related to the Mullumbimby Gauge (4)

Mullumbimby Gauge Height (m AHD)	No. Properties with Over floor Flooding
4.38 (50% AEP)	2
4.6 (10% AEP)	8
4.81 (5% AEP)	25
5.02 (2% AEP)	87
5.24 (1% AEP)	152
5.44 (0.5% AEP)	303
5.64 (0.2% AEP)	495
6.99 (PMF)	1178

- Please note this information is for Mullumbimby only and does not include Upper Main Arm, Main Arm and Durrumbul.

Table 10: Estimated number of properties inundated above floor level in Brunswick Heads related to the Mullumbimby Gauge (4)

Mullumbimby Gauge Height (m AHD)	No. Properties with Over floor Flooding
4.38 (50% AEP)	0
4.6 (10% AEP)	4
4.81 (5% AEP)	5
5.02 (2% AEP)	23

5.24 (1% AEP)	63
5.44 (0.5% AEP)	83
5.64 (0.2% AEP)	101
6.99 (PMF)	401

2.5.6 Isolation

a. In the Mullumbimby Sector, properties can become isolated throughout the full range of design flood events.

b. In the Upper Main Arm area beyond Palmwoods T-intersection there could be upwards of 25 homes requiring resupply during normal flooding in the Main Arm of the Brunswick River, but this number could dramatically increase during a protracted flood period (2).

Table 11: Isolated houses for the full range of design flood events in the Mullumbimby Sector (4)

Suburb	50% AEP	10% AEP	5% AEP	2% AEP	1% AEP	0.5% AEP	0.2% AEP	PMF	Total
Mullumbimby	9	110	639	390	296	255	161	2	2852
Main Arm	4	4	4	4	9	8	4	4	41
Myocum	1	1	0	0	0	0	0	0	2
Brunswick Heads	0	3	0	0	13	3	0	51	70

2.5.7 Flood Mitigation Systems

a. There are no major flood mitigation works within the Mullumbimby township (2).

2.5.7 Dams

a. There are no known dam failure consequences within the Mullumbimby Sector.

2.5.8 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Byron Shire LGA including schools, childcare centres, hospitals, aged and infirm, infrastructure and caravan parks are shown in Annex 3.

2.5.9 Other Considerations

a. There are a significant number of people living off the grid in multiple occupancy dwellings in the hinterland above Mullumbimby. Accurate statistics for the number of people and dwellings are not held and it is likely that telecommunications may be limited.

2.6 GREATER OCEAN SHORES

Brunswick River Basin

2.6.1 Community Overview

a. The Greater Ocean Shores Sector is located to the north of Mullumbimby Sector, east of Billinudgel and The Pocket Sector and south of Tweed Shire and encompasses Ocean Shore, South Golden Beach and New Brighton.

b. Ocean Shores has a population of 4818 people living in 1855 dwellings as recorded by the 2021 census. It has an indigenous population of 2.7%.

c. South Golden Beach has a population of 2219 people living in 799 dwellings as recorded by the 2021 census. It has an indigenous population of 2.8%.

d. New Brighton has a population of 368 living in 130 dwellings as recorded by the 2021 census. It has an indigenous population of 1.1% (1).

2.6.2 Characteristics of Flooding

a. The Greater Ocean Shores Sector is subject to riverine and overland flooding.

2.6.3 Flood Behaviour

Ocean Shores

a. In the 20% AEP event, the flooding is fairly contained within the greenspace and golf course. There is a residential area between the golf course and the Pacific Motorway that is inundated in this event.
b. In the 2% AEP event, flood waters encroach on properties to the south of the golf course, the south of Orana Road becomes inundated along with parts of Narooma Drive, Reka Way, Kiah Close and Kooringa Court.
c. Balemo Drive runs in a north-south loop through Ocean Shores. The model results suggest that the northern section of the road near its junction with Brunswick Valley Way is flood prone. Here, flooding across Balemo Drive occurs in a 20% AEP event and progressively worsens as the flood magnitude increases. Thus, Balemo Drive is cut off at its northern end from Brunswick Valley Way.
d. However, the remainder of Balemo Drive remains flood free up to and including a 1% AEP event and local residents can exit via the southern end at Orana Road. For the 0.02% AEP event, flooding along Balemo Drive is more widespread, which will render local residents that use Balemo Road for access isolated. In the PMF flood, the flood inundation is more widespread, causing more flooding to residential houses and access roads. Much of Brunswick Valley Way and the Pacific Motorway remain flood immune. However, there is some flooding to Brunswick Valley Way and the Pacific Motorway where they cross Marshalls Creek (5).
e. Narooma Drive is subject to flooding with properties experiencing inundation.

South Golden Beach

a. Flooding in this area is fairly contained within the greenspace and canal system until the 1% AEP event.
b. In the 0.02% AEP event there is widespread flooding to the east of the canal caused by flooding along Rangal Road and Berrimbillah Court.
c. For the PMF flood event, South Golden Beach is completely inundated between Shara Boulevard and the ocean.
d. In addition, this area is threatened by local drainage flooding. The levees along the canal protect the South Golden Beach area from high flood levels in the canal. Backflow prevention devices have been installed on the drain outlets on the canal banks to prevent flood waters in the canal flowing back up through the drains (under the levees) into the South Golden Beach area. However, when the drainage outlets are blocked by the backflow prevention devices, the drainage system will cease to operate under gravity. Therefore, a pumping system has been installed to pump local runoff in the drainage system into the canal during a flood, thereby mitigating the potential for local drainage flooding. Should the pumps fail (due to power failure or malfunction) or be insufficient in capacity, local runoff in the drainage system will accumulate and may cause flooding (5).

New Brighton

a. The northern section of New Brighton (i.e. west of Byron Street) is predicted to be fully inundated in a 5% AEP design flood event.
b. Peak flood depths and velocities are predicted to remain low up to the 0.02% AEP design flood event. The park area between Byron Street and Park Street is predicted to convey floodwaters towards South Golden Beach, and is predicted to become a medium hazard area in a 0.02% AEP flood event.
c. In a PMF event, the entire area east of Marshalls Creek is also predicted to be inundated, with only the parcels east of River Street remaining as low hazard (16).

2.6.4 Classification of Floodplain

a. The Greater Ocean Shores Sector can be further broken down into subsectors for floodplain classification, these classifications are as follows:

OBJECTID	Polygon Name	Population Estimate	Dwelling Estimate	Vehicle Estimate	Flood Classification
139	FEO New Brighton	216	140	252	Low Flood Island
164	Oceanshores North	603	276	497	Rising Road Access
165	Oceanshores South	360	160	288	Rising Road Access
191	South Golden Beach A	1178	584	1051	Low Flood Island
192	South Golden Beach B	567	256	461	Low Flood Island

2.6.5 Inundation

Ocean Shores

a. Balemo Drive will usually have some water over it as a result of flooding at Minor to Moderate levels at the Billinudgel Gauge (202400 – 558020). At the northern end of the drive, wash from vehicles using the road may cause inundation to occur in some homes. In a Major flood, some Narooma and Balemo Drive homes have above floor water encroachment, as they did during the May 1987, 2005 and 2022 floods (2).

Table 12: Estimated number of properties inundated above floor level in Ocean Shores related to the Billinudgel gauge. (4)

Billinudgel Gauge Height (m AHD)	No. Properties with Over floor Flooding
3.7 (10% AEP)	0
3.9 (5% AEP)	2
4.1 (2% AEP)	14
4.23 (1% AEP)	38
4.37 (0.5% AEP)	46
4.5 (0.2% AEP)	120
5.8 (PMF)	614

South Golden Beach

a. In the 2005 flood, water did not overtop the levee from Capricornia Canal (came within 0.3m of the top of the levee at the end of Gloria Street), however the majority of flooding came from Yelgun Creek along with overland flooding that impacted properties in South Golden Beach. At the end of Helen Street, water was 1.4m.
b. In the 2005 floods 200 properties in South Golden Beach were affected which led to 94 residents being evacuated, from the following streets: Berrimbilla Court, Barkala Court, Rangal Road, Konda Court, Redate Road, Canowindra Court. (2)
c. In 2022 the flood levee was overtopped and the power failed to operate the pump.

Table 13: Estimated number of properties inundated above floor level in South Golden Beach related to the Billinudgel gauge (4).

Billinudgel Gauge Height (m AHD)	No. Properties with Over floor Flooding
3.7 (10% AEP)	0
3.9 (5% AEP)	0
4.1 (2% AEP)	0
4.23 (1% AEP)	0
4.37 (0.5% AEP)	0
4.5 (0.2% PMF)	95
5.8 (PMF)	352

New Brighton

a. In the 20% AEP event, there are minimal properties that are inundated in New Brighton. In the 10% AEP event, properties in the southern part of New Brighton become

inundated, and by the 5% AEP event, most of the properties in this part of town are inundated.

b. In the northern part of New Brighton, some properties off Park Street are inundated in the 10% AEP event.
c. By the 5% AEP event, the properties along Casons Lane and River Street are inundated. For the 5% AEP to 0.02 AEP events, the extent of flooding in this area doesn't significantly change.
d. In the PMF event New Brighton is completely inundated as flood waters overtop the dunes and flow into the ocean (5).

Table 14 Estimated number of properties inundated above floor level in New Brighton related to the Billinudgel gauge. (4)

Billinudgel Gauge Height (m AHD)	No. Properties with Over floor Flooding
3.7 (10% AEP)	11
3.9 (5% AEP)	24
4.1 (2% AEP)	97
4.23 (1% AEP)	105
4.37 (0.5% AEP)	109
4.5 (0.2% AEP)	120
5.8 (PMF)	192

2.6.6 Isolation

a. Access roads in northern Ocean Shores, South Golden Beach and New Brighton are cut by the 20% AEP event and evacuation needs to occur before this (12).

Table 15: Isolated houses for the full range of design flood events in the Greater Ocean Shores Sector (4)

Suburb	50% AEP	10% AEP	5% AEP	2% AEP	1% AEP	0.5% AEP	0.2% AEP	PMF	Total
Ocean Shores	0	0	3	10	11	25	63	2	114
South Golden Beach	0	0	0	0	0	0	26	0	26
New Brighton	20	20	15	2	1	1	0	11	60

2.6.7 Flood Mitigation Systems

Table 16: Levees in Greater Ocean Shores Sector, summary of information

South Golden Beach Levee	
Location	South Golden Beach is enclosed by a levee that is designed to protect it to a height of 3.2m AHD equivalent to a 1% AEP event. However, if localised heavy rain is experienced after the Capricornia Canal reaches a level high enough to close the floodgates, there is likely to be water

	ponding behind the levee. Water would need to reach a depth of 300 mm before it would threaten to inundate any homes. If the constructed levee was breached or overtopped by flood waters it would potentially flood the South Golden Beach area including Royal Avenue, Gloria, Robin, Peter, and Helen Streets, to the East, and Phillip and Clifford Streets to the West of Capricornia Canal. There is an open drainage network at the rear of residences in South Golden Beach that drains excess rainfall from the town into the Capricornia canal, through a flap gate slightly north of Gloria Street. A number of flapped pipes exist to prevent water from Capricornia canal entering South Golden Beach, as well as providing drainage outlets for flood and rainwater in the town. A pump exists within South Golden Beach to extract water from behind the levee. This is a high-volume pump capable of pumping water from the entire area. Though levees are designed to prevent inundation, they do not offer absolute protection and will be over-topped during severe floods, necessitating evacuations. Levees can also fail through piping, seepage and erosion of the levee. (2)
Type of Levee (ring etc)	Earthen levee
Owner	Byron Shire Council
Design Height and freeboard	4.2m AHD
Overtopping Height	4.2m AHD
No. of properties protected	The community at South Golden Beach are currently protected from flooding by a levee along the eastern and western sections of Capricornia Canal. This levee was constructed in 1989 with pumps installed in 2006 to reduce flooding behind the levee. The levee is currently set at a level of 4.2 m AHD to protect South Golden Beach properties within the 1% AEP flood event (4).
Known low points	None
Location and sequence of inundation	The levee did overtop in the 2022 event. The flood gates in the levee also do not provide a prefect seal and water can back flow through the levee.
Consequences of levee overtopping or failure	An overtopping / levee failure assessment was undertaken for the 1% AEP design event and the PMF design event to understand the potential impact to flood risk should the levee fail. For the 1% AEP design event an additional 272 properties in South Golden Beach will be impacted from flooding with depths ranging from 0.1m to over 1m. The levee is already overtopped in the PMF design event and therefore there are negligible impacts seen in the peak level difference mapping. (4)
Deficiencies	

2.6.8 Dams

a. There are no known dam consequence failures in the Greater Ocean Shores Sector.

2.6.9 At Risk Facilities

a. The facilities that are at risk of flooding and/or isolation within the Byron Shire LGA including schools, childcare centres, hospitals, aged and infirm, infrastructure and caravan parks are shown in Annex 3.

2.6.10 Other Considerations

a. No other considerations have been identified.

SPECIFIC RISK AREAS – COASTAL EROSION

a. The Byron Shire Council area is bordered by the Pacific Ocean to the east. There are three main types of beach units within the Shire boundaries: compartmentalised, sheltered, and exposed. The coastal areas are subject to natural coastal processes and resultant coastline hazards that include coastal erosion, oceanic inundation, and shoreline recession. The major coastline hazards occur from Broken Head in the south, to South Golden Beach in the north.

b. The coastal erosion/oceanic inundation problem in the Byron Shire takes two forms:

   i. Undercutting of dunes on their seaward sides, threatening the collapse of dwellings and other infrastructure (Belongil Spit and New Brighton Beach).

   ii. The potential breaking through of the dunes by sea water, causing flooding and isolation of property on the landward side of the dunes (Belongil Spit, South Golden Beach, New Brighton Beach, Main Beach).

   iii. The most severe problems of coastal erosion/inundation occur as a result of oceanic storm conditions associated with the passage of ex-tropical cyclones and temperate-zone low-pressure systems. These storms may cause temporary sea level rises with large associated waves. The worst erosion/inundation is likely when severe weather conditions occur in conjunction with high tides.

   iv. The main beach units within the Byron Shire Council area are Tallow Beach Unit, Cape Byron to The Pass Unit, The Pass to Belongil Creek Unit, Belongil Creek to Brunswick River, and North of the Brunswick River including Crabbes Creek Beach .

Coastal Forecast District

2.7 TALLOW BEACH AND BROKEN HEAD

a. In this beach unit an undeveloped buffer zone exists seaward of infrastructure and development that can accommodate short term coastal erosion impacts. The Byron Shire Coastline Hazard Definition Study (WBM Oceanics, 2000) estimates shoreline recession for this unit at 0.1 m per year with 0.3m per year in the southern hook at Broken Head. If this recession is realised, then sections of Suffolk Park community may come under coastal erosion threat in 50-100 years (19).

Table 17: Streets affected by coastal erosion (19).

Road Name	Town	Coastal Area
Manfred Street	Belongil Spit	The Pass to Belongil Creek
Don Street	Belongil Spit	The Pass to Belongil Creek

Border Street	Belongil Spit	The Pass to Belongil Creek
North Head Road	New Brighton	North of Brunswick River
The Esplanade	New Brighton	North of Brunswick River
Strand Avenue	New Brighton	North of Brunswick River
River Street	New Brighton	North of Brunswick River
Pacific Esplanade	South Golden Beach	North of Brunswick River

2.8 CAPE BYRON TO THE PASS

a. This beach unit is protected from severe coastal erosion by Cape Byron. At Wategos Beach a seawall constructed along Marine Parade limits shoreline recession (19).

2.9 THE PASS TO BELONGIL CREEK (SPIT)

a. This area has over the years experienced significant fluctuations in the shoreline. The area between The Pass and the Memorial Pool has become more stable since the construction of rock protection works at the northern end of Jonson Street in the 1960s. North of the Memorial Pool to Belongil Creek is the area of highest risk in the Shire because of its location in the southern hook of the embayment and the associated shoreline recession that is occurring there.

b. Storms in 1999 caused severe erosion, especially along Belongil Spit. Several houses were threatened with collapse and the dune system was nearly breached at Manfred Street.

c. Although protection measures are in place along Belongil Spit there is significant development and infrastructure at immediate threat from coastal erosion should these measures fail. Development and infrastructure at threat includes dwellings (approximately 15), the First Sun Holiday Park and the Byron Bay Surf Life Saving Club. The northern bend of Border Street may also be cut by coastal erosion which could cause access problems to Belongil Spit.

d. Storm activity is sometimes accompanied by heavy rain causing flooding on the creeks behind the sand dunes (for example Marshalls Creek and Belongil Creek). This flooding can be exacerbated by an elevated sea level preventing the escape of floodwaters to the sea. Flooding in Belongil Creek combined with oceanic inundation could restrict access to properties north of Manfred Street.

e. Evidence exists of the sea breaking through the dunes at Jonson St, Byron Bay, in 1954. This caused flooding on the leeward side of the dunes. Waves also broke over the dunes and caused flooding in the CBD (19).

2.10 BELONGIL CREEK (SPIT) TO BRUNSWICK RIVER

a. The coastline from Belongil Creek to Brunswick River is relatively undeveloped, apart from a low-density resort and golf course immediately north of the Belongil Creek entrance. The Tyagarah Nature Reserve occupies a large section of this coastal area.

b. When the Belongil Creek entrance channel migrates north sections of the resort and golf course come under threat.

c. Construction of the Brunswick River training walls has resulted in accretion of Brunswick South Beach at Brunswick Heads (19).

2.11 NORTH OF THE BRUNSWICK RIVER (INCLUDING CRABBES BEACH)

a. Storms from 1967-1974 combined with the Brunswick River training walls caused significant erosion in this area. Sheltering Palms (also known as North Beach), located north of the Brunswick River, was lost to the sea in 1974 and subsequently abandoned.

b. New Brighton has experienced historical shoreline recession and was under threat during the storms between 1967-74. However, in recent years, the re-establishment of the sand transport system around the Brunswick River entrance has seen a period of shoreline stability. This has been aided by dune stabilisation works in the area.

c. At South Golden Beach extensive sand mining and urban development of the area caused damage to the frontal dunes and a reduction in the buffering capacity of the dunes to large storm events. Dune care works have since enhanced the capacity of the dunes to accommodate erosion (19).

d. Some of the easternmost roads at New Brighton and South Golden Beach are within the immediate hazard zone of coastal erosion. There is an identified oceanic inundation threat in an area of low dunes north of New Brighton village and at South Golden Beach. There is also a potential for breakthrough of Marshalls Creek south of New Brighton .

ROAD CLOSURES AND ISOLATED COMMUNITIES

2.12 ROAD CLOSURES

a. Table 18 lists roads liable to flooding in the LGA.

Table 18: Roads liable to flooding in Byron Shire LGA. (2)

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
Byron Sector				
Sunrise Blvd	Corner of Ewingsdale Road	Parts of Sunrise isolated		20% AEP event
Lawsons Street	Corner of Middleton Street			20% AEP event
Jonson Street	South of Woolworths	Isolation		20% AEP event
Massinger Street	South of Lawson Street roundabout	Isolation		20% AEP event
Paterson Lane	Intersection with Kipling Street	Isolation		20% AEP event
Bangalow Road	South of Cooper Street	Isolation		
Bangalow Sector				
Lismore Road		Potential for isolation		
Pacific Motorway		Potential for isolation		
Billinudgel and The Pocket Sector				
Wilfred Street	Corner of Spencer Road	Closed to all but 4WD vehicles		2.5m-3.0m Billinudgel Gauge
The Pocket and Middle Pocket	Between The Pocket/Middle Pocket and Billinudgel		None	2.5m-3.0m Billinudgel Gauge
Wilfred Street		Closed to all traffic		3.0m-3.5m Billinudgel Gauge
The Pocket and Middle pocket	Between The Pocket/Middle Pocket and Billinudgel			3.0m-3.5m Billinudgel Gauge
Mullumbimby Sector				
Main Arm Road	Above Palmwoods Junction			2.5m-3.5m Mullumbimby Gauge
Main Arm Road		Main Arm Road is open until 3.5m, however is cut at		3.5m Mullumbimby Gauge

		numerous points further upstream from west Mullumbimby		
Fern Street, Main Arm Road, Left Bank Road		Access to Wilsons Creek and Jubilee Road are impassable		3.5m-4.5m Mullumbimby Gauge
Riverside Drive		Isolation		3.5m-4.5m Mullumbimby Gauge
Jubilee Ave and Myocum Street	Near top end of Golf Course	Access to Wilsons Creek, Myocum and Mullumbimby only by 4WD		4.0m Mullumbimby Gauge
Burringbar St and Tyagarah Street		Eastern part of Mullumbimby isolated		4.4m Mullumbimby Gauge
Dalley Street		Inundated at 5m and access road for evacuation centre		5m at Mullumbimby Gauge
Tincogan Street		Depending on the type of flood event Tincogan Street can be overtopped when the Mullumbimby gauge reaches anywhere between approximately 3.5 m AHD to 5m AHD.		3.5m to 5m at Mullumbimby Gauge
Coolamon Scenic Drive	At Federation Bridge	Unable to access Ticogan and Daley Street for evacuation centre access		5m at Mullumbimby Gauge
Major Roads into Mullumbimby		Mullumbimby isolated		4.4m Mullumbimby Gauge
Pacific Highway	At Mooball and Tyagarah	Brunswick Heads isolated		4.5m Mullumbimby Gauge
Greater Ocean Shores Sector				
Orana Road	From Reka Way to Kira Close	Northern Ocean Shores isolated	Evacuation via southern Orana Road before evacuation route closed	3.55m at Billinudgel Gauge
Strand Avenue	Strand Avenue Bridge	New Brighton isolated	Evacuation before 20% AEP event	3.76m at Billinudgel Gauge

Shara Boulevard	Towards Brunswick Valley Way	South Golden Beach isolated		2.5m at Billinudgel Gauge

2.13 SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

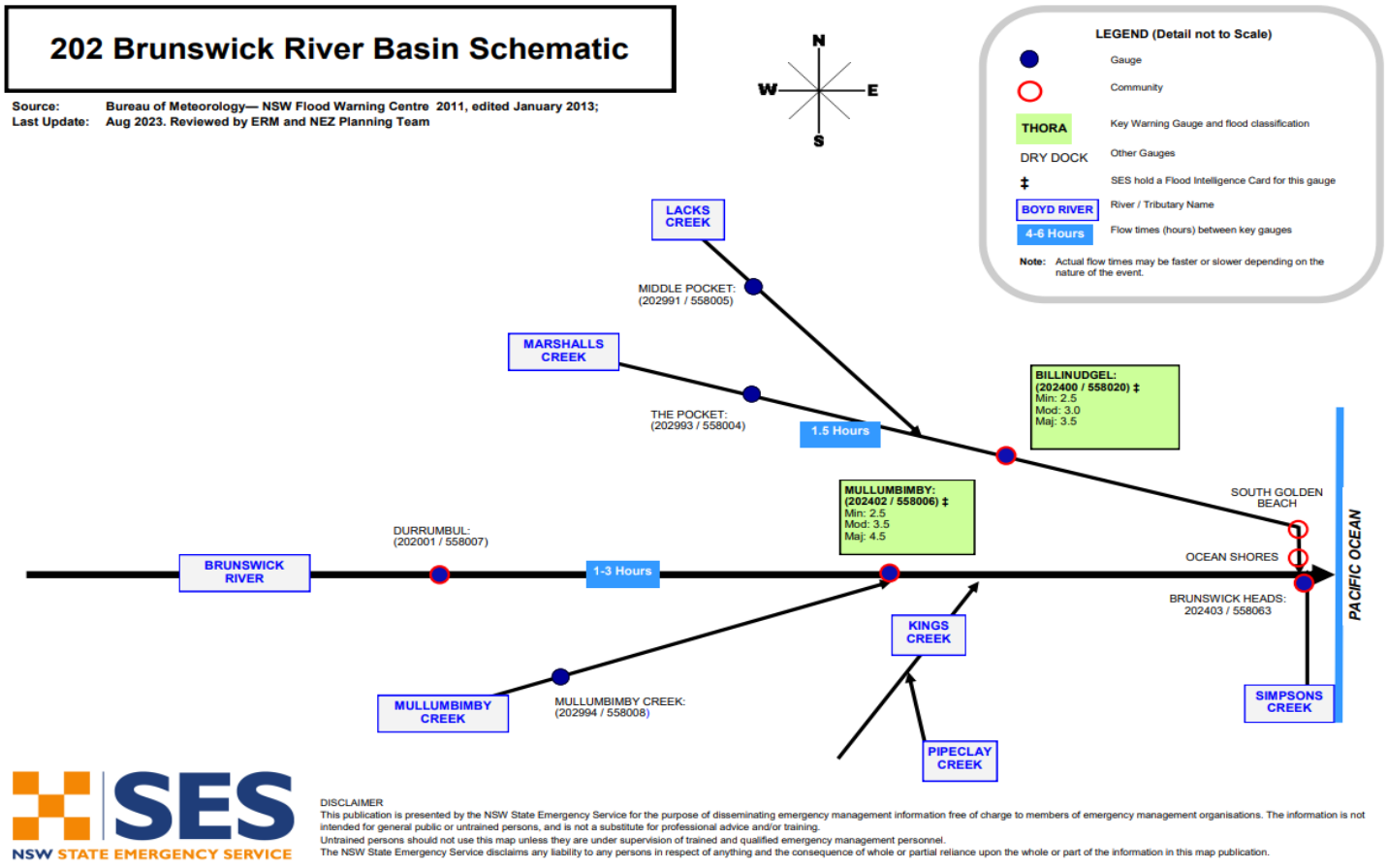
a. Table 19 lists communities liable to isolation and potential periods of isolation. Information presented here is based on historical events and does not reflect the duration of isolation expected in larger and extreme events.

Table 19: Potential Periods of Isolation for communities in the Byron Shire LGA during a Major Flood

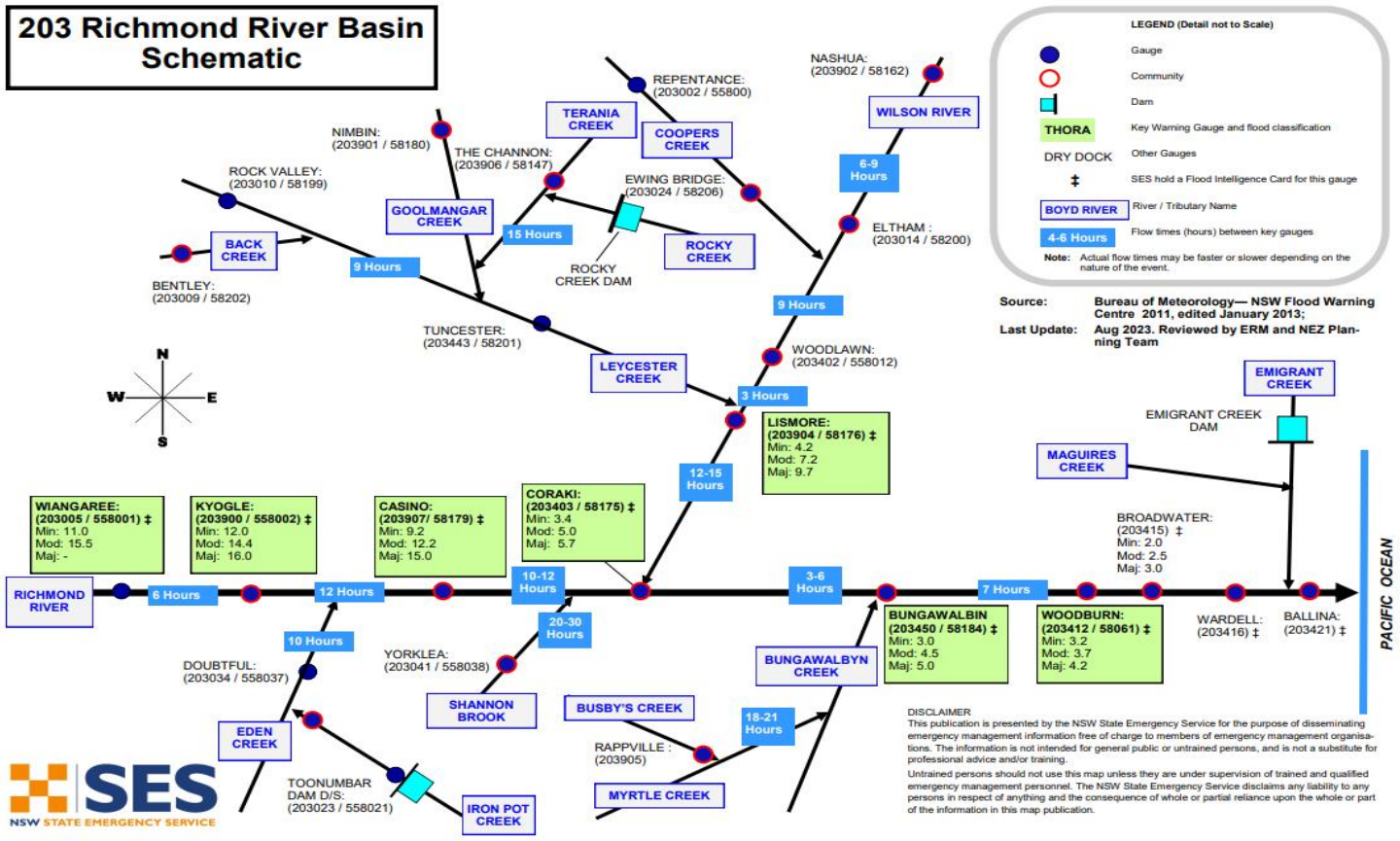
Town / Area (River Basin)	Population/ Dwellings	Flood Affect Classification	Approximate period isolation	Days								NOTES
				1	2	3	4	5	6	7	8	
Upper Wilsons Creek	79pp, 38 dwellings	High flood island	1 – 2 days									Supply by air
Upper Main Arm	283 pp, 152 dwellings	High Flood Island	2 – 3 days									Supply by air
Huonbrook	99pp, 52 dwellings	High Flood Island	2 – 3 days									Supply by air
Brunswick Heads	1686pp. 1015 dwellings	Low Flood Island	1 – 5 days									Resupply generally not required
Durrumbul	300pp approximately	2-3 days	2-3 days									Supply by air
Main Arm	640pp, 234 dwellings	2-3 days	2-3 days									Supply by air
The Pocket	231pp, 88 dwellings	2-3 days	2-3 days									Supply by air

Note: Periods of isolation are a guide only. Liaison with the Local Controller and communities/residents involved is essential during periods of potential and actual isolation.

ANNEX 1: BRUNSWICK RIVER BASIN SCHEMATIC



ANNEX 2: RICHMOND RIVER BASIN SCHEMATIC



ANNEX 3: FACILITIES AT RISK OF FLOODING AND/OR ISOLATION

*Inundation data in the below table is based on the inundation layers currently available to SES. Areas currently blank will need to be monitored during floods as affects are currently uncertain.

Facility Name	Street	Suburb	Comment
Schools			
Bangalow Public School	41- 71 Byron St	Bangalow	This facility is outside the flood extent
Brunswick Heads Public School	12 Fingal St	Brunswick Heads	This facility is outside the flood extent
St Finbarr's Catholic Primary School	165 Bangalow Rd	Byron Bay	This facility is outside the flood extent
Byron Community Primary School	53 Tennyson St	Byron Bay	This facility is outside the flood extent
Byron Bay High School	2 Arakwal Ct	Byron Bay	This facility is outside the flood extent
Byron Bay Public School	17 Kingsley St	Byron Bay	This facility may be inundated in a PMF event
Cape Byron Rudolf Steiner	216 Balraith Lane	Byron Bay	This facility is outside the flood extent
St Finbarr's Convent	Broken Head Rd	Byron Bay	This facility is outside the flood extent
Coorabell Public School	21 Mango Ln	Coorabell	This facility is outside the flood extent
Eureka Public School	Eureka Road	Eureka	This facility is outside the flood extent
Goonengerry Public School	14 Goonengerry Rd	Goonengerry	This facility is outside the flood extent
Durrumbul Public School	Durrumbul Road	Main Arm	This facility is outside the flood extent
Mullumbimby High School	9 Jubilee Ave	Mullumbimby	
Hinterland Christian College	114 Main Arm Rd	Mullumbimby	
Mullumbimby Steiner School - Shearwater Steiner School	349 Left Bank Rd	Mullumbimby	
St Johns Primary School	11 Murwillumbah Rd	Mullumbimby	This facility is outside the flood extent
Mullumbimby Public School	Morrison Ave	Mullumbimby	This facility may be inundated in a 1% AEP event

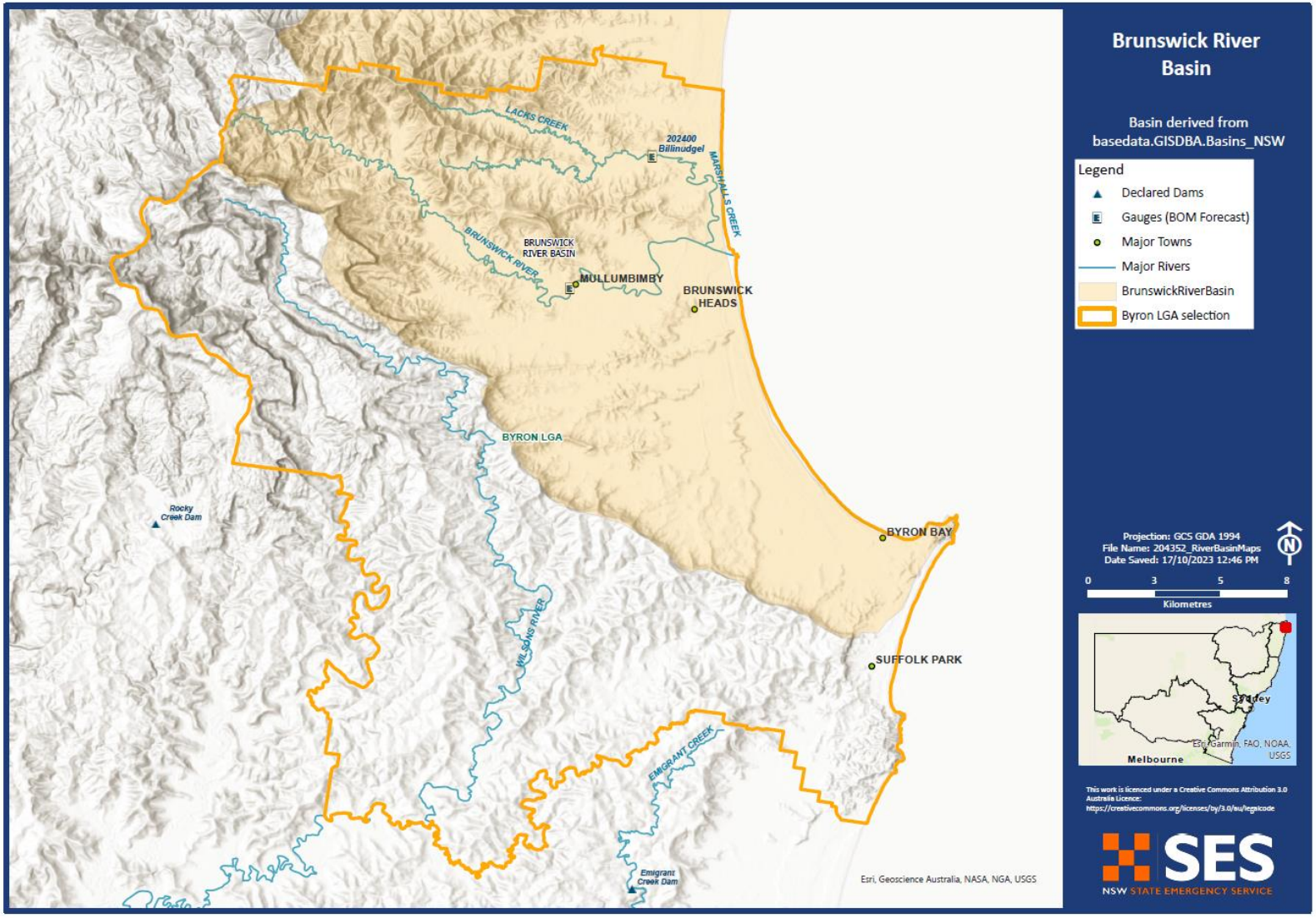
Ocean Shores Public School	121 Shara Blvd	Ocean Shores	This facility may be inundated in a PMF event
The Pocket Public School	The Pocket Road	The Pocket	
Upper Coopers Creek Public School	Upper Coopers Creek Road	Upper Coopers Creek	
Main Arm Upper Public School	1129 Upper Main Arm Road	Upper Main Arm	
Wilsons Creek Public School	722 Wilson's Creek Road	Wilsons Creek	
Child Care Centres			
Bangalow Community Children's Centre	1 Raftons Road	Bangalow	
Mirabelle Early Learning & Education Centre	29-33 Granuaille Road	Bangalow	
Harmony Early Learning	1B Ballina Road	Bangalow	
Billi Lids Long Day Care Centre	Brunswick St	Billinudgel	This facility will be inundated in a 20% AEP event
Lilly Pilli Little School	96 Kingsford Dr	Brunswick Heads	
Goodstart Early Learning Byron Bay	2 Blackbutt Pl	Byron Bay	This facility is one the edge of the PMF extent
Byron Bay Preschool – Cavanbah Centre	35 Marvel St	Byron Bay	This facility may be inundated in a PMF event
Byron Busy Kids	19 Brigantine St	Byron Bay	This facility may be inundated in a 5% AEP event
Kool Beanz	88 Centennial Circuit	Byron Bay	This facility is one the edge of the PMF extent and may become isolated
Periwinkle Preschool	5 Sunrise Blvde	Byron Bay	This facility is outside the flood extent
Sandhills Early Childhood Centre	6 Gilmore Cres	Byron Bay	This facility is outside the flood extent
Federal Community Childrens Centre	898 Binna Burra Road	Federal	This Facility is outside the Flood Extent
Cobbers Child Care Centre	8 Tincogan Street	Mullumbimby	
Durrumbul Community Preschool	Main Arm Rd	Mullumbimby	
Kool Beanz Academy	36 Left Bank Rd	Mullumbimby	

Mullumbimby Community Preschool	90 Station St	Mullumbimby	This facility may be inundated in a 1% AEP event.
Kool Beanz	58 Rajah Rd	Ocean Shores	This facility may be inndated in a 5% AEP event.
Ocean Shores Preschool	121 Shara Blvd	Ocean Shores	Inundated in PMF
Ocean Shores Early Learning Centre	3 Aldinga Court	Ocean Shores	Outside of Flood Extent
Kool Beanz	17 Clifford Street	Suffolk Park	Opening soon
Byron Bay Preschool - Coogera Centre	49-51 Bottlebrush Cresent	Suffolk Park	This facility may be inundated in a 1% AEP event.
Wilsons Creek Preschool	722 Wilsons Creek Rd	Wilsons Creek	Outside of Flood Extent
Facilities for the aged and/or infirm			
Feros Village Bangalow	6 Byron Bay Rd	Bangalow	Outside Flood Extent
Byron Aged Care	1 Butler St	Byron Bay	Inundated in PMF
Feros Care Residential Village Byron Bay	29-33 Marvel St	Byron Bay	Inundated in PMF
Byron Central Hospital	54 Ewingsdale Rd	Ewingsdale	Outside of Flood Extent
Catholic Healthcare - Coolamon Villa	1 Reservoir Rd	Mullumbimby	Isolation
Patrick Bugden VC Gardens Aged Care Home	184 Broken Head Road	Suffolk Park	Inundated in PMF
Utilities and infrastructure			
Bangalow Sewage Treatment Plant		Bangalow	
Brunswick Heads Telephone Exchange		Brunswick Heads	
Byron Bay Sewage Treatment Plant		Byron Bay	
Byron Bay Telephone Exchange		Byron Bay	

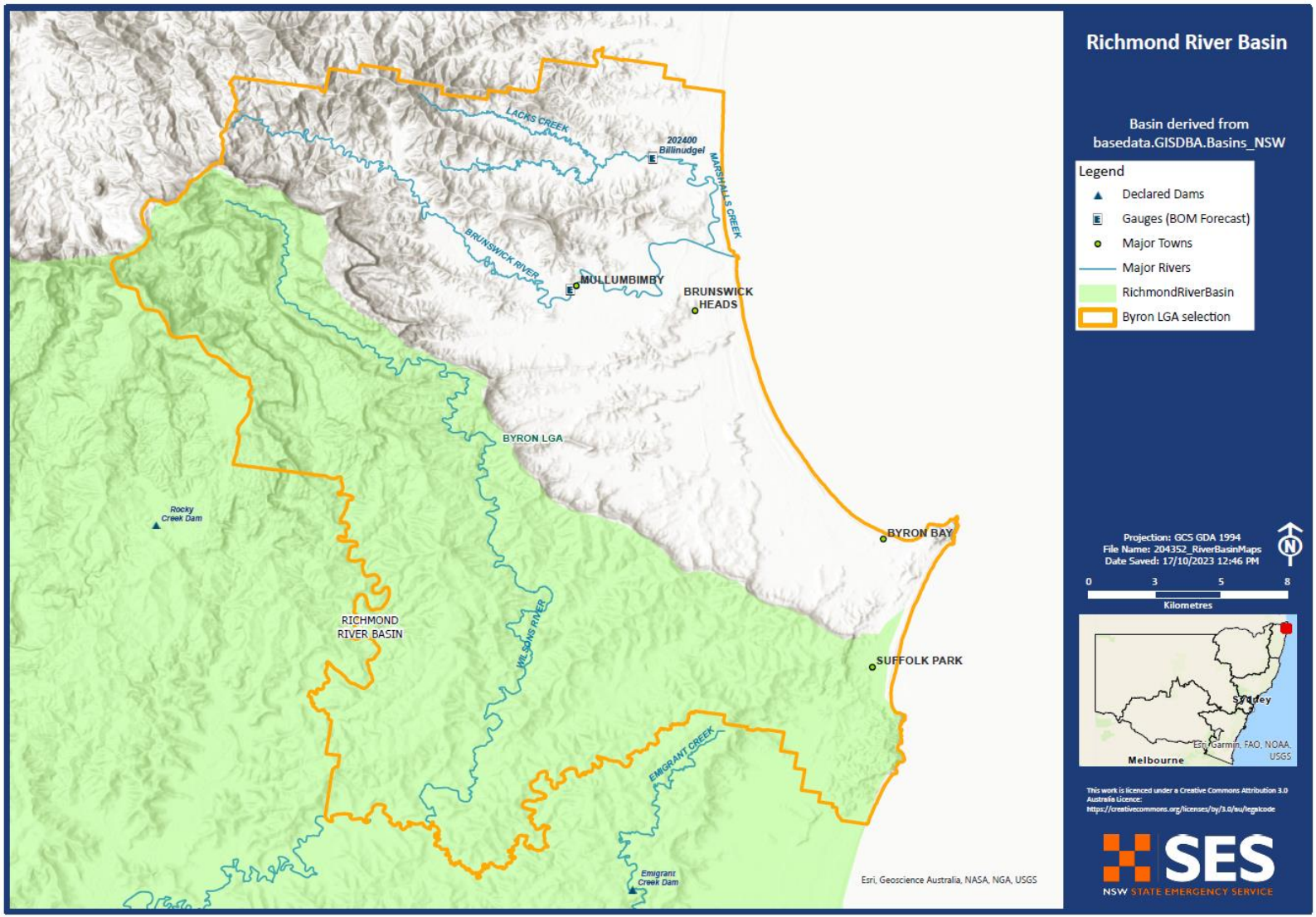
Clunes Telephone Exchange		Clunes	
Ewingsdale Telephone Exchange		Ewingsdale	
Federal Telephone Exchange		Federal	
Goonengerry Telephone Exchange		Goonengerry	
Huonbrook Telephone Exchange		Huonbrook	
Main Arm Telephone Exchange		Main Arm	
Brunswick Valley Sewage Treatment Plant		Mullumbimby	
Mullumbimby Telephone Exchange		Mullumbimby	
Ocean Shores Sewage Treatment Plant		Ocean Shores	
Ocean Shores Telephone Exchange		Ocean Shores	
Suffolk Park Telephone Exchange		Suffolk Park	
Camping Ground / Caravan Parks			
Broken Head Holiday Park	184 Broken Head Rd	Broken Head	Outside of Flood Extent
North Coast Holiday Park – Terrace Reserve	Fingal St	Brunswick Heads	This facility may be inundated in a 1% AEP event.
North Coast Holiday Park – Massey Greene	Tweed St	Brunswick Heads	This facility may be inundated in a 1% AEP event.
North Coast Holiday Park – Ferry Reserve	Riverside Crescent	Brunswick Heads	This facility may be inundated in a 1% AEP event.
First Sun Holiday Park	Lawson St	Byron Bay	Isolation
Belongil Fields	394 Ewingsdale Rd	Byron Bay	Inundated in a PMF
Discovery Park	399 Ewingsdale Rd	Byron Bay	This facility may be inundated in a 1% AEP event.

Ingenia Holidays Byron Bay	5-37 Broken Head Rd	Byron Bay	Outside of Flood Extent
Reflections Holiday Park	1 Lighthouse Rd	Byron Bay	Outside of Flood
Maca's Camping Ground	1156 Main Arm Rd	Mullumbimby	Outside of Flood Extent
Mullumbimby RLFC and Caravan Park	25 Manns Road	Mullumbimby	This facility may be inundated in a 1% AEP event.
Mullumbimby Showground (Campground)	62 Main Arm Road	Mullumbimby	This facility may be inundated in a 1% AEP event.
Suffolk Beachfront Holiday Park	143 Alcorn St	Suffolk Park	Isolated

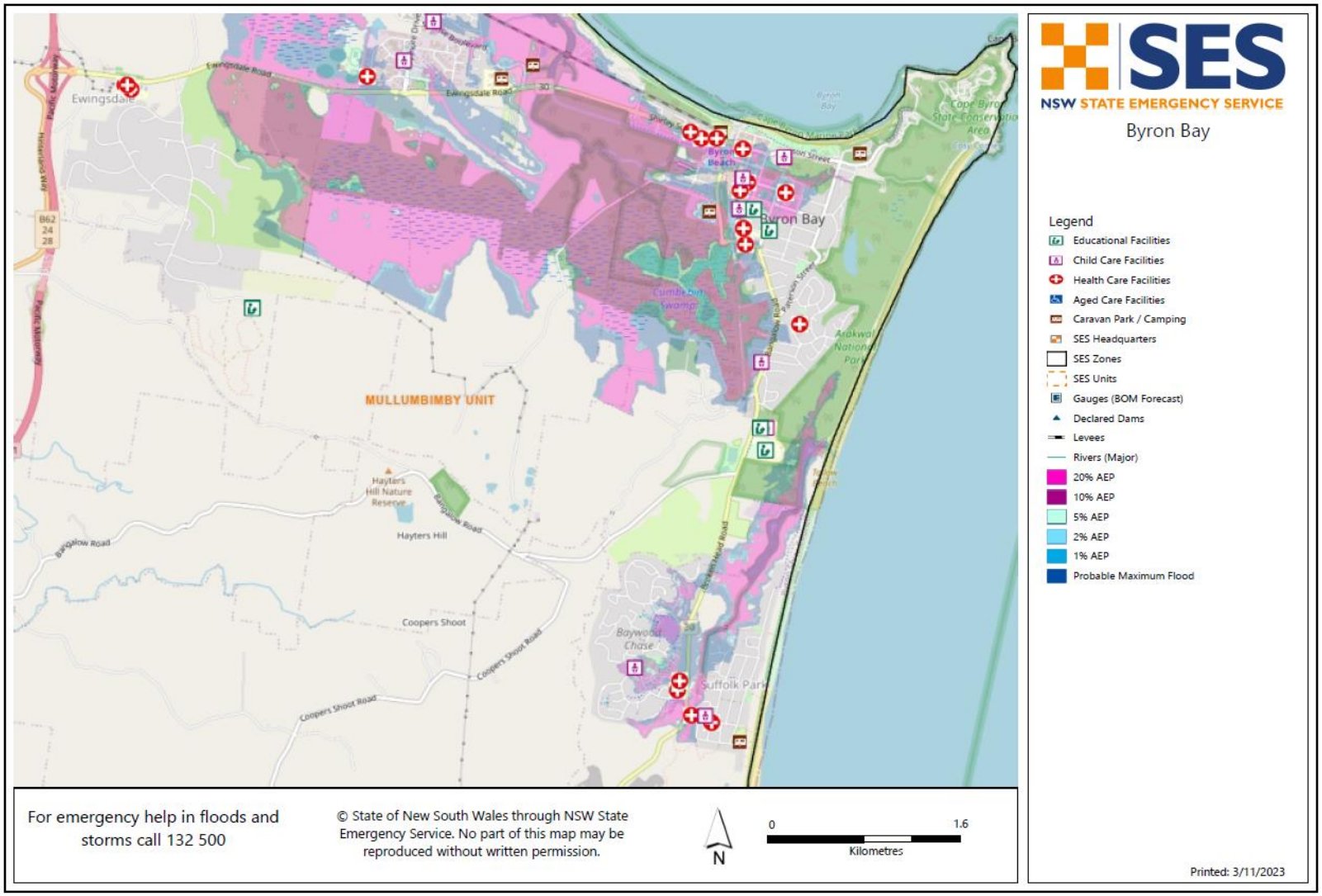
MAP 1: BRUNSWICK RIVER BASIN



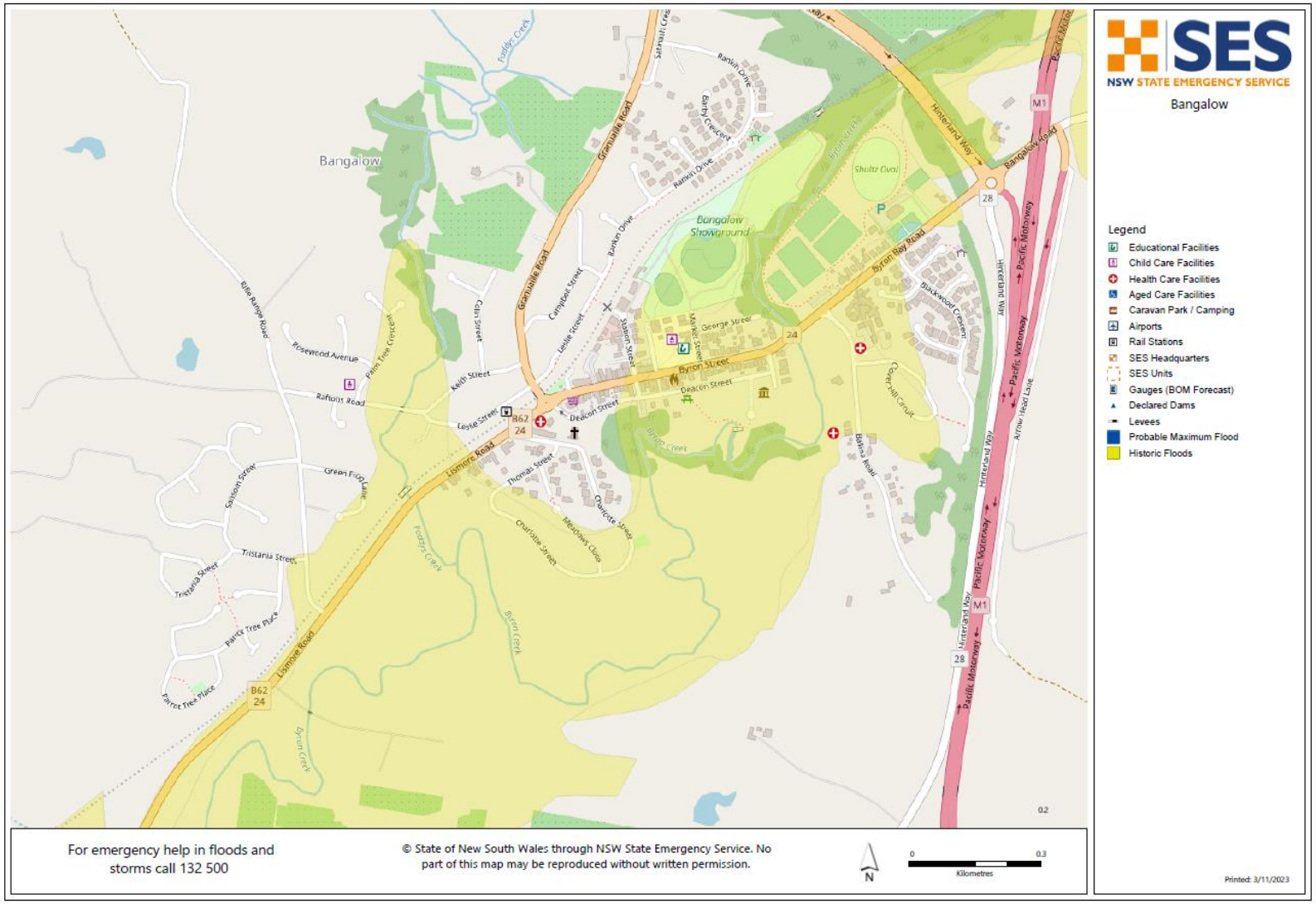
MAP 2: RICHMOND RIVER BASIN



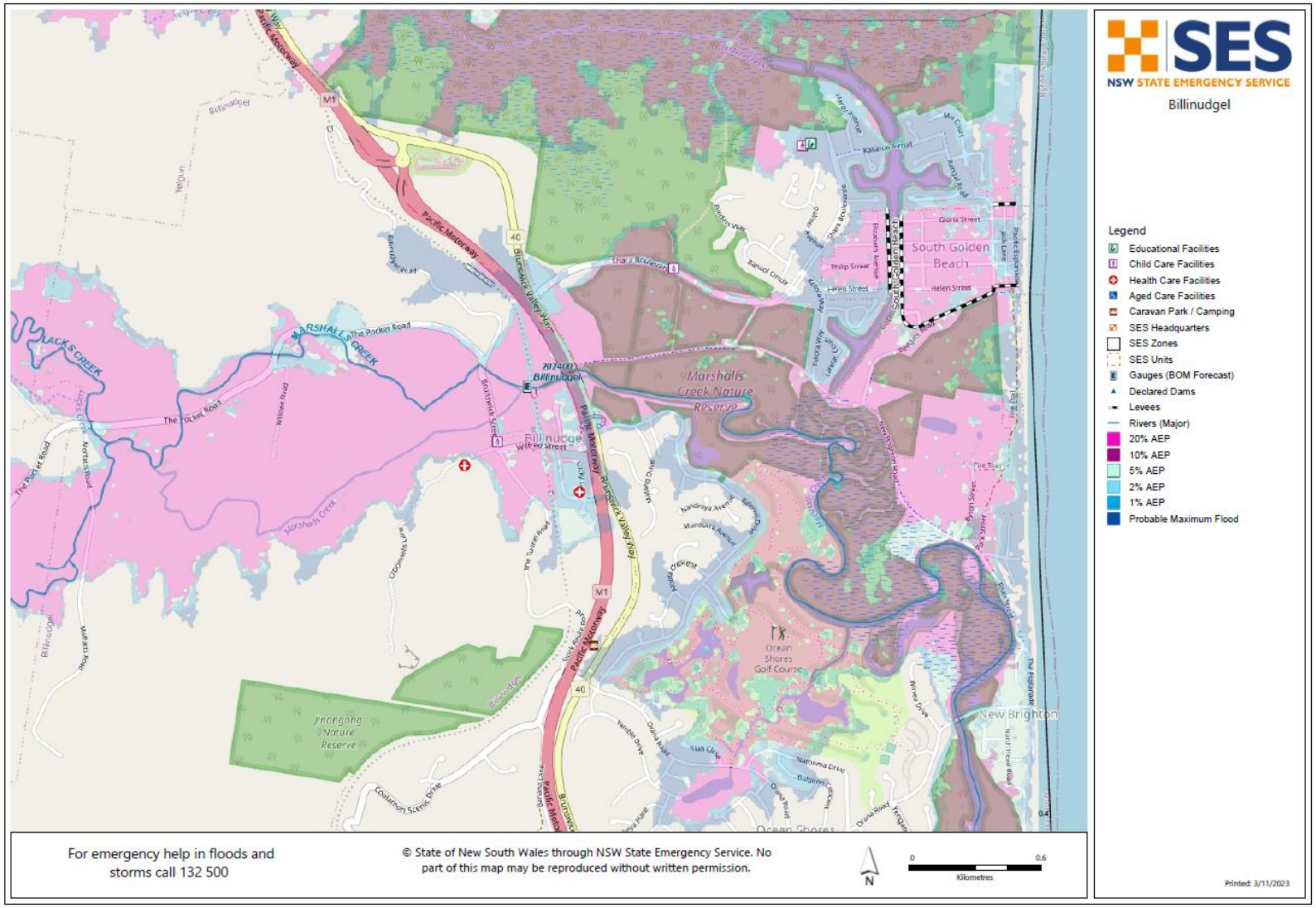
MAP 3: BYRON BAY TOWN MAP



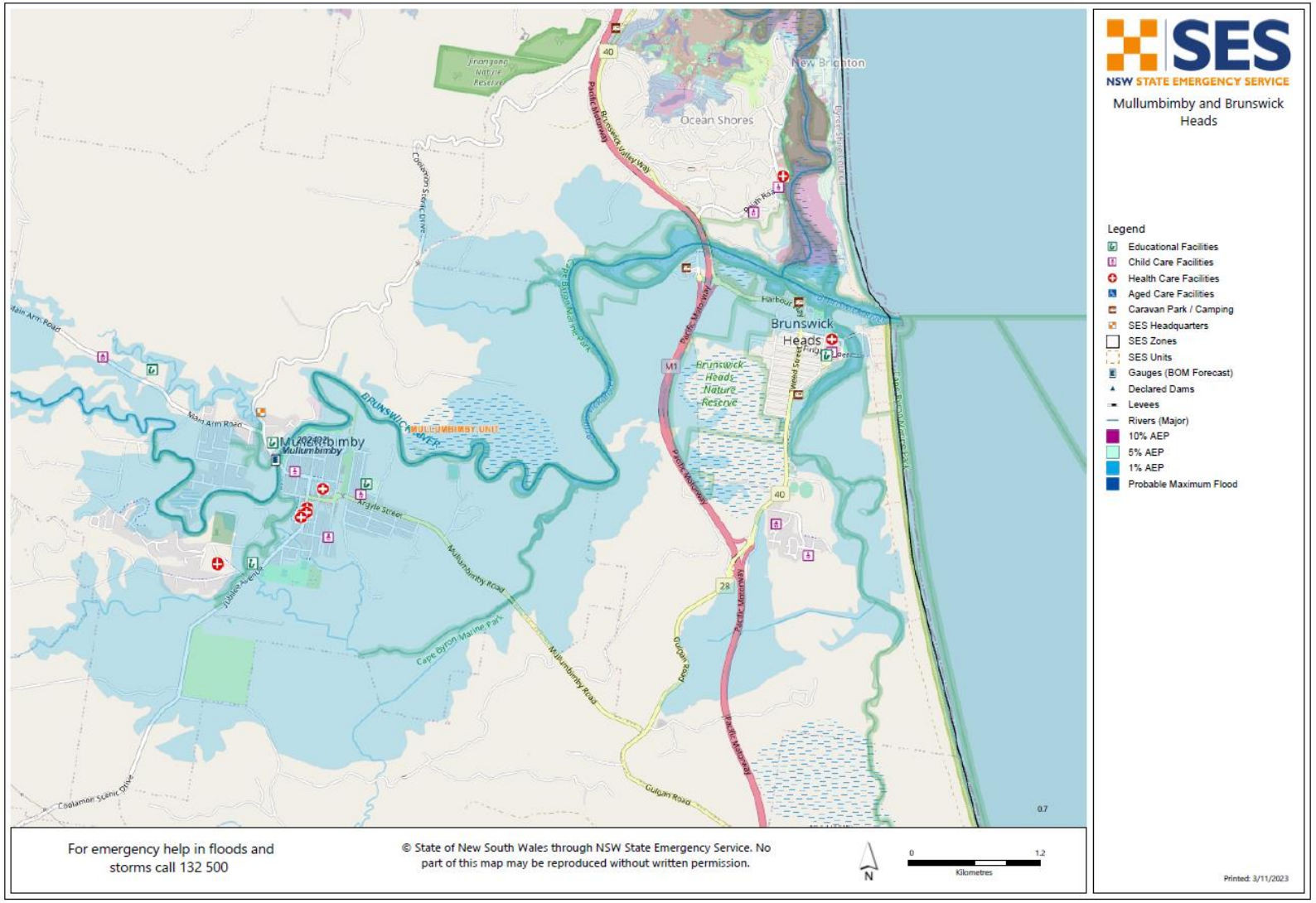
MAP 4: BANGALOW TOWN MAP



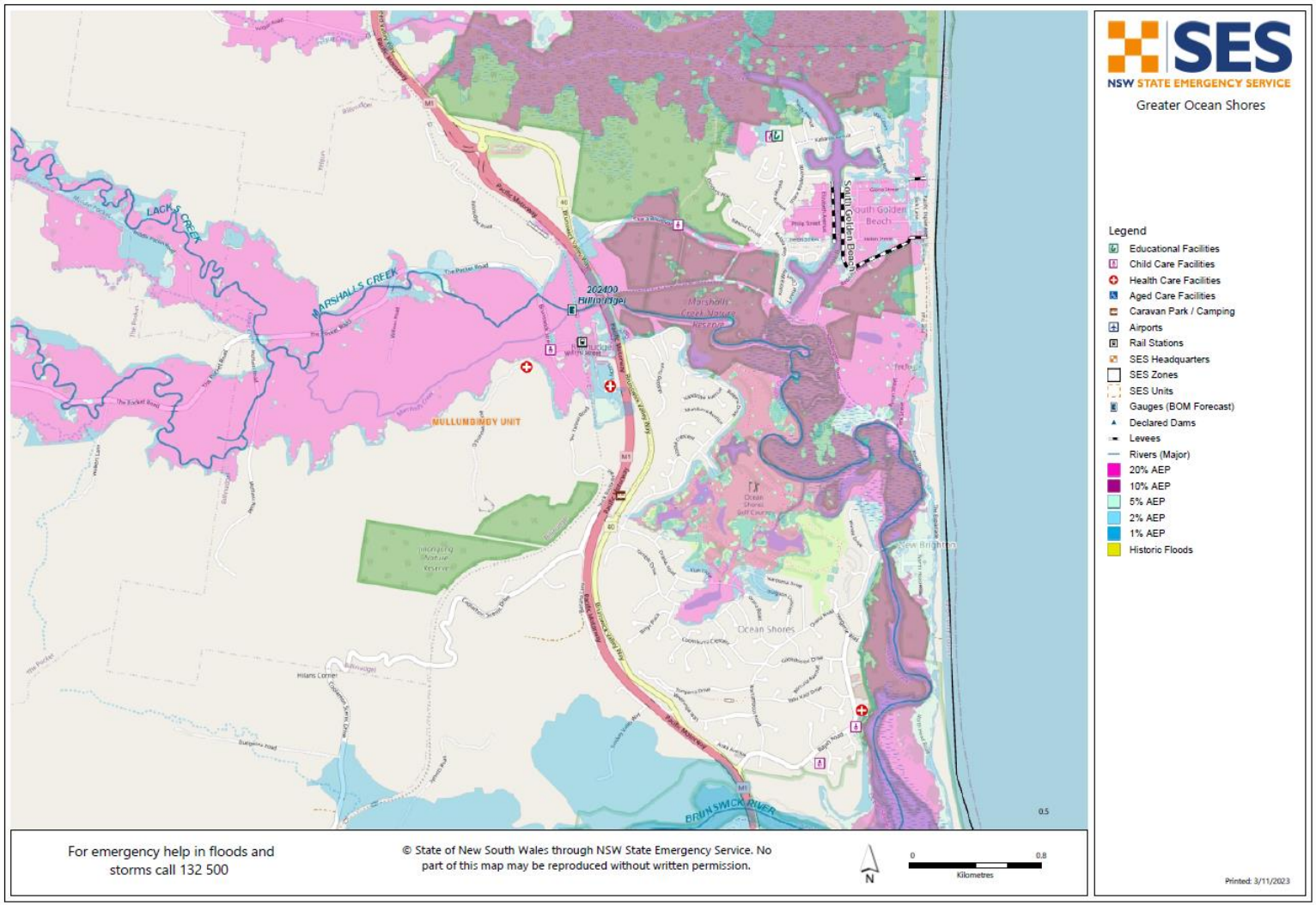
MAP 5: BILLINUDGEL TOWN MAP



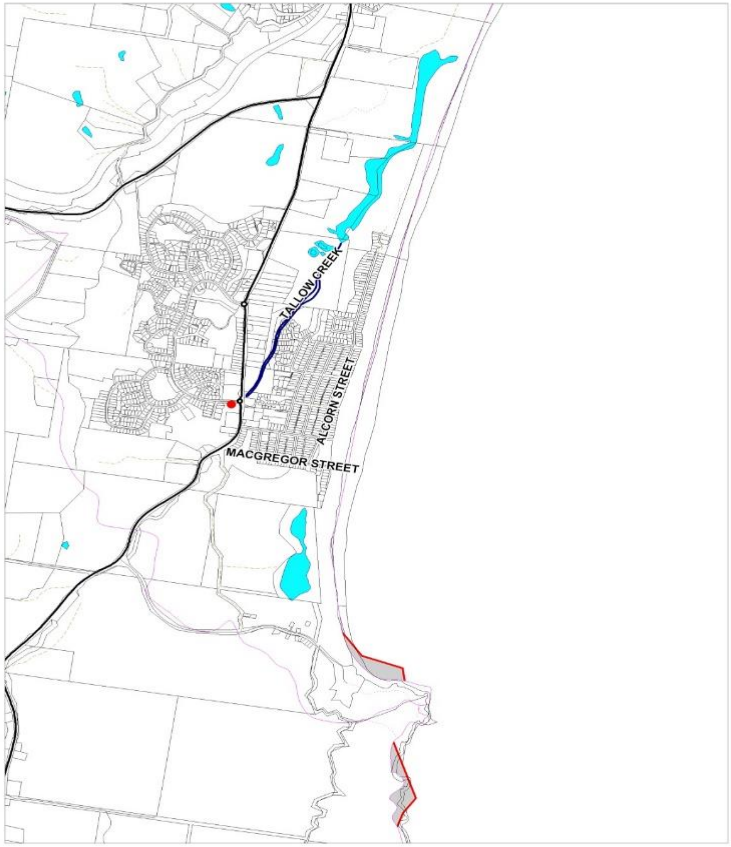
MAP 6: MULLUMBIMBY TOWN MAP



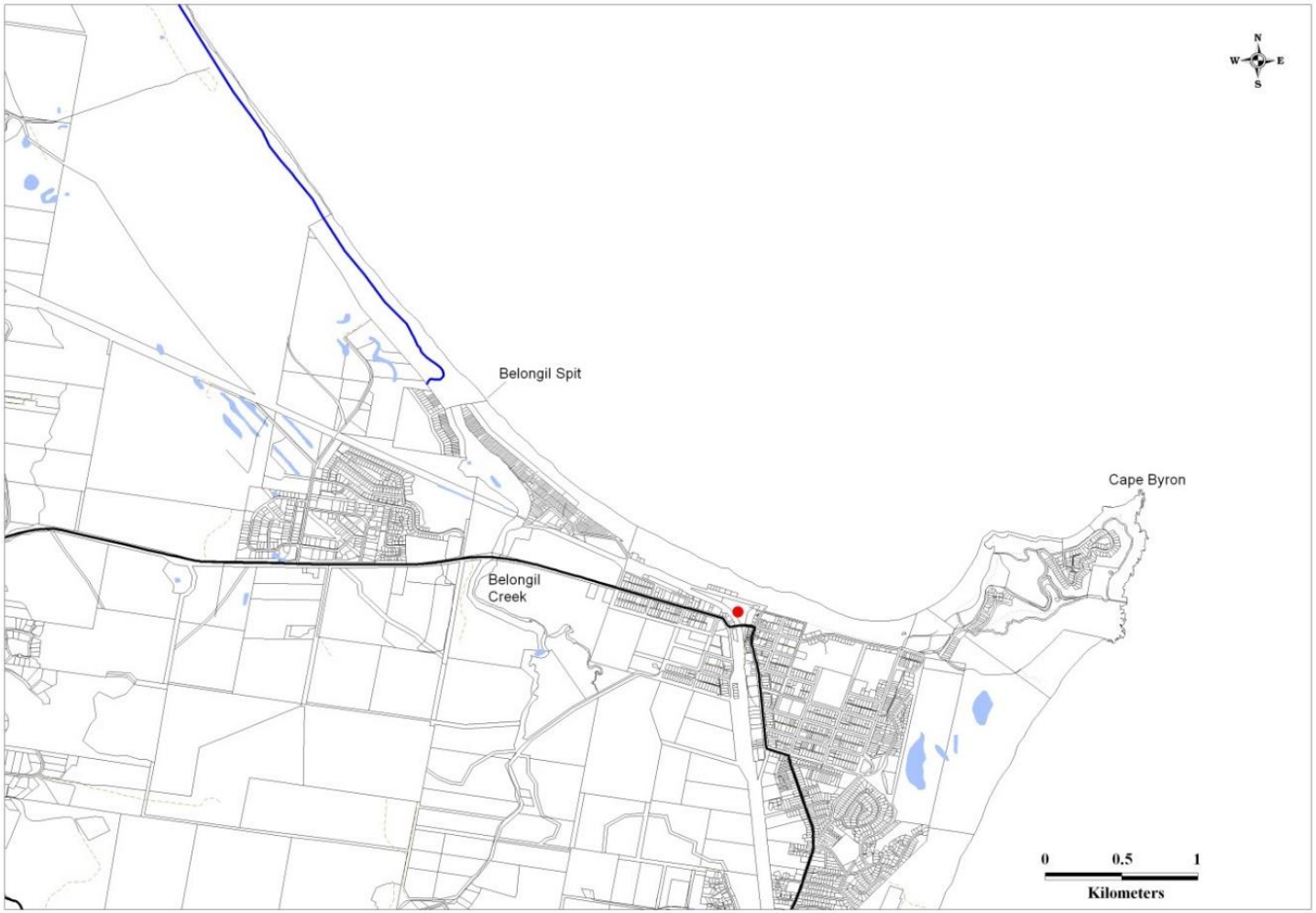
MAP 7: GREATER OCEAN SHORES TOWN MAP



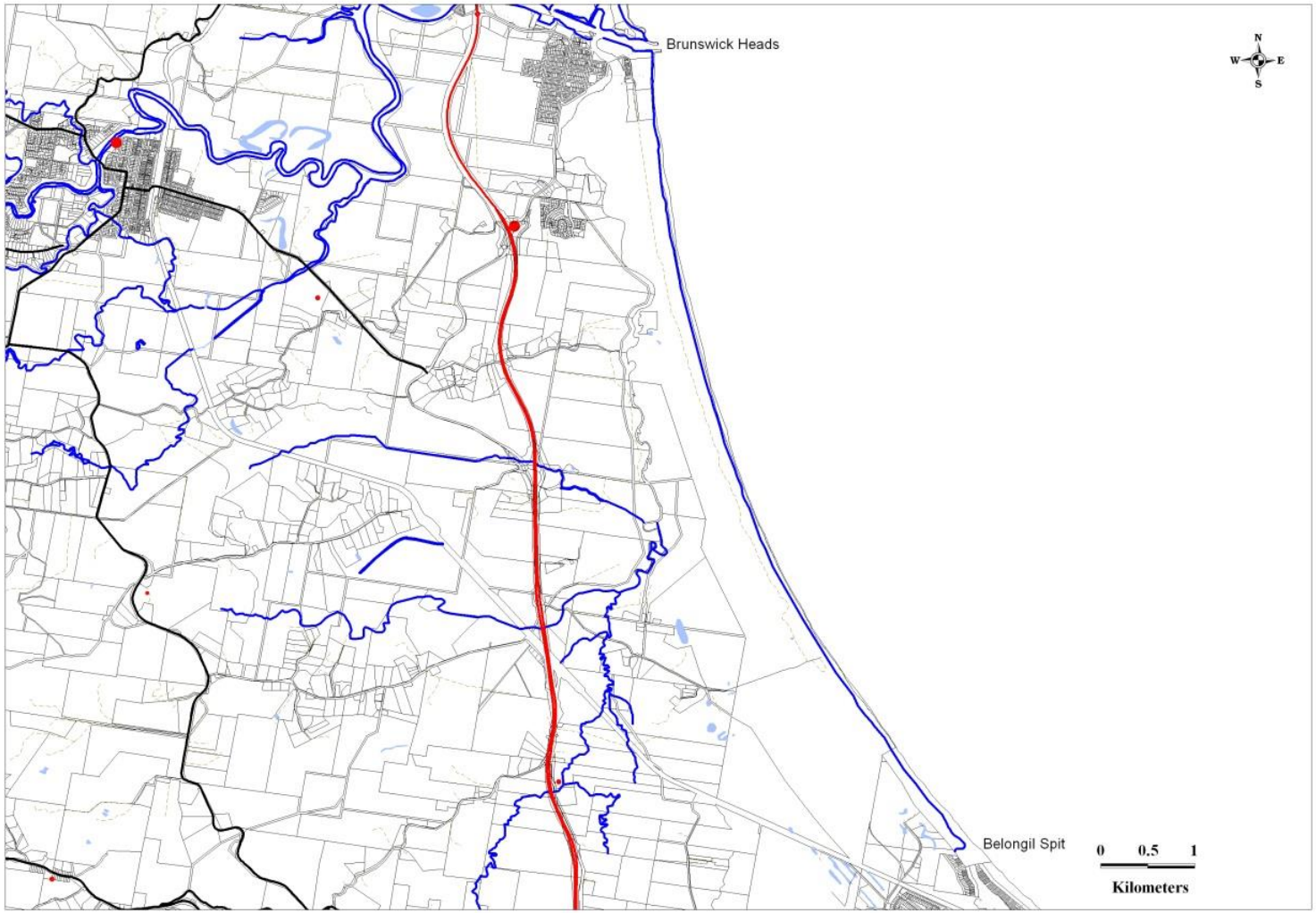
MAP 8: TALLOW CREEK TO BROKEN HEAD



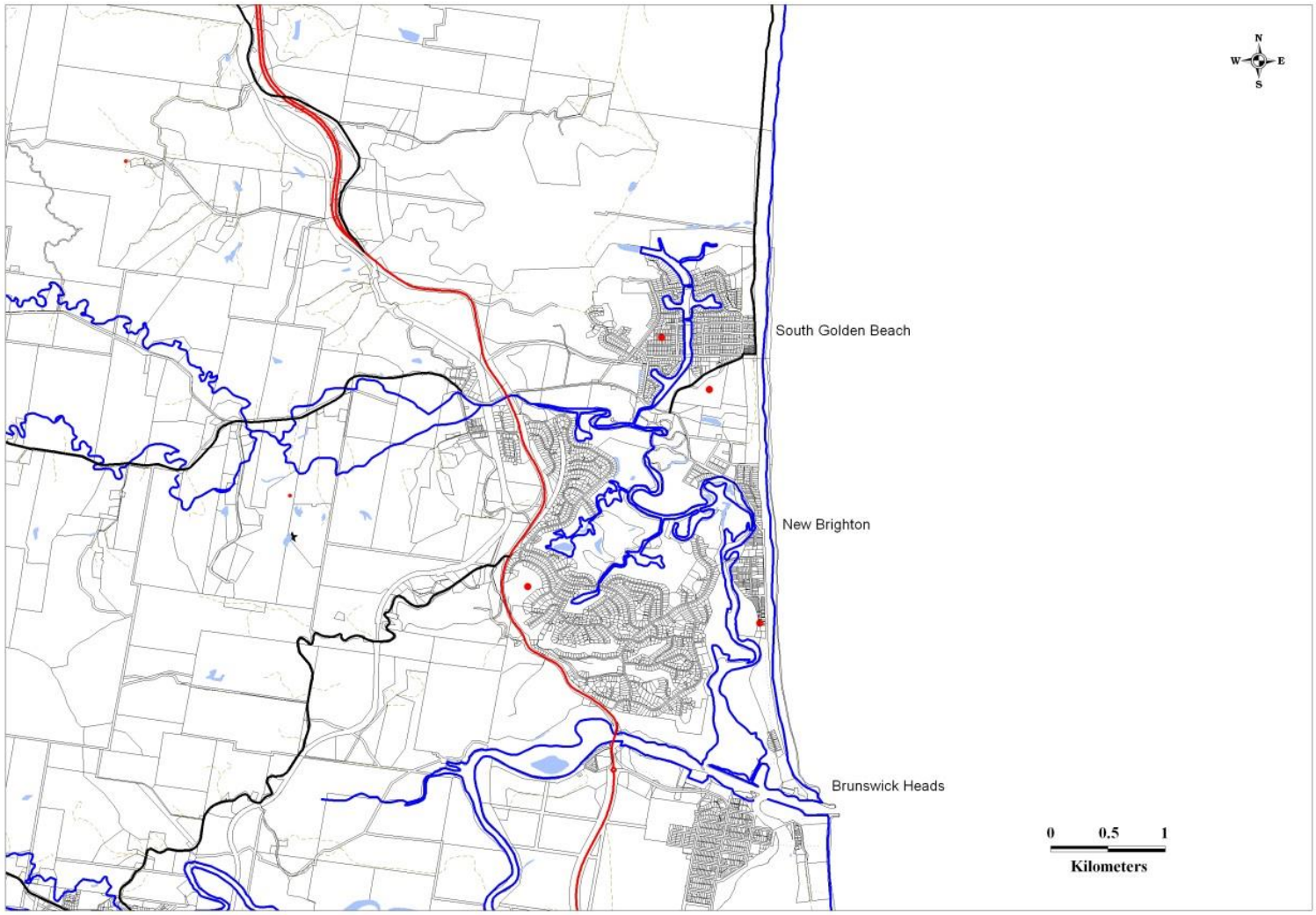
MAP 9: THE PASS TO BELONGIL CREEK COASTAL EROSION



MAP 10: BELONGIL CREEK TO BRUNSWICK HEADS COASTAL EROSION



MAP 11: NORTH OF BRUNSWICK RIVER COASTAL EROSION



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BYRON SHIRE FLOOD WARNING SYSTEMS AND ARRANGEMENTS

Chapter 1 of Volume 3 (NSW SES Response Arrangements for Byron Shire) of the Byron Shire Flood Emergency Sub Plan

Last Update: May 2024

AUTHORISATION

NSW SES Locality Response Arrangements in Byron Shire Council has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Elena Palamara (May 8, 2024 08:50 GMT+10)

NSW SES North Eastern Zone Coordinator Planning (Elena Palamara)

Date: 07/05/2024

Approved

NSW SES North Eastern Zone Acting Deputy Zone Commander (Telesia Loloa)

Date: 07/05/2024

Tabled at LEMC

Date: 08/05/2024

Document Issue: V3.2-07042014

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1. GAUGES MONITORED BY THE NSW SES MULLUMBIMBY LOCAL HEADQUARTERS

Table 1: Gauges monitored by the NSW SES Mullumbimby Local Headquarters

Gauge Name	Type	AWRC No.	Bureau Gauge No.	Stream	Flood level classification in metres			Special Reading Arrangements	Owner
					MIN	MOD	MAJ		
Billinudgel *‡	Automatic	202400	558020	Marshalls Creek	2.5m	3.0m	3.5m		Byron Shire Council NSW OEH
Mullumbimby *‡	Automatic	202402	588006	Brunswick River	2.5m	3.5m	4.5m		Byron Shire Council NSW OEH
Durrumbul	Automatic	202001	558007	Brunswick River	-	-	-		Byron Shire Council/ Water NSW
Mullumbimby Creek (Azalea St)	Automatic		558111	Mullumbimby Creek	-	-	-		Byron Shire Council
Belongil Creek Bridge †	Automatic		558099	Belongil Creek	-	-	-		Byron Shire Council
Tallow Creek Bridge †	Automatic		558098	Tallow Creek	-	-	-		Byron Shire Council

Notes: The Bureau of Meteorology provides flood warnings for the gauges marked with an asterisk (*).
NSW SES Local Flood Advices are provided for the gauges marked with a single cross (†).
The NSW SES holds a Flood Intelligence Card for the gauges marked with a double cross (‡)

2. DISSEMINATION OPTIONS FOR NSW SES FLOOD INFORMATION AND WARNING PRODUCTS

As the combat agency for flood, storm and tsunami NSW SES has a statutory responsibly to issue warnings and public information to affected communities (NSW SES Act s 8). Warnings include advice about options and likely impacts of an event. The Incident Controller is accountable for preparing and disseminating accurate warning products during an incident.

2.1 DISSEMINATION OF WARNINGS:

NSW SES disseminates warnings through the following platforms. Please note that the NSW SES can utilise a number of methods to disseminate warnings which can include:

- NSW SES Website
    - www.ses.nsw.gov.au
- HazardWatch
    - HazardWatch is currently online at www.hazardwatch.gov.au .
    - Warnings are managed through this platform.
- Hazards Near Me NSW App
- Doorknocking
- National Emergency Alert System
- Social Media
    - The following are some social media accounts:
        - Facebook (@NSWSES)
        - Facebook (@Northern Rivers NSW SES)
        - Facebook @SESMullumbimby)
        - Facebook (Local community pages, Local business pages)
        - Twitter (@NSWSES)
        - Instagram (@NSWSES)
- Community Meetings
- Byron Shire Council Emergency Dashboard

Television Stations:

Station	Location
ABC TV (Channel 2, 20 & 21)	Northern NSW
ABC NEWS, (Channel 24)	Northern NSW
NBN (Channel 8, 81)	Northern NSW
SBS (Channel 3)	Northern NSW
WIN/10 (Channel 5)	Northern NSW
Seven West (Channel 6, 61)	Northern NSW
SkyNews (Channel 53)	Northern NSW

Radio Stations:

Station	Location	Frequency	Modulation
Bay FM	Byron Bay	99.9 FM	
ABC Radio	North Coast	738 AM 94.5 FM	
Radio 97	Mullumbimby	104 FM	
Big Country Radio	Ocean Shores	87.8 FM	

Digital/On-Line Services

- Streaming Services
- Podcasts
- YouTube Channels

Other Agencies:

Stakeholders include:

- Byron Shire Council
- Chamber of Commerce
- Business Owners
- Not for Profit Organisations
- NDIS and Community Care Providers
- Aged Care Providers
- Emergency Services
- Department of Education
- Schools and Child Care
- NSW Health
- Media Outlets
- Byron Shire Community Resilience Network
- Australian Red Cross
- Others where appropriate

BYRON SHIRE NSW SES LOCALITY RESPONSE ARRANGEMENTS

Chapter 2 of Volume 3 (NSW SES Response Arrangements for Byron Shire) of the Byron Shire Flood Emergency Sub Plan

Last Update: May 2024

AUTHORISATION

NSW SES Locality Response Arrangements in Byron Shire Council has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

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SECTOR OVERVIEW

Table 1: Overview of Sectors in the Byron Shire LGA.

These Sectors provide further detail of the planned response strategies within Communities in the Byron Shire LGA.

Sector Name	Community	Sector Basis	Total properties	Properties potentially at risk
Sector 1, Byron Bay	Byron Bay, Suffolk Park	Primarily Rising Road Access in Byron Bay, Belongil Beach is a Low Flood Island, Byron coastal strip to the east is a High Trapped Perimeter. Discovery Holiday Park is a Low Flood Island. Suffolk Park is a Low Flood Island along Tallow Creek, with Rising Road Access north and west of Tallow Creek. High Flood Islands to the east along the coast and west in Baywood Chase and Byron Hills.	6525	There are approximately 683 properties at risk of inundation.
Sector 2, Bangalow	Bangalow, Upper Wilsons Creek, Huonbrook, Federal, Eureka.	Rising Road Access	2266	Approximately 38 properties in Upper Wilsons Creek, 152 properties in and 21 properties in Wanganui at risk of isolation. Federal and Eureka may become isolated due to landslips.
Sector 3, Billinudgel	Billinudgel, The Pocket, Middle Pocket	Rising Road Access	208	Approximately 23 properties are at risk of inundation.
Sector 4, Mullumbimby	Mullumbimby, Brunswick Heads, Main Arm, Mullumbimby Creek	Mullumbimby, largely a Low Flood Island with Rising Road Access and Overland Escape Routes. Brunswick Heads has Rising Road Access, eastern Brunswick	3780	Approximately 1178 in Mullumbimby, and 401 properties in Brunswick Heads are at risk of inundation.

		Heads is a Low Trapped Perimeter.		
Sector 5, Greater Ocean Shores	Greater Ocean Shores (Ocean Shores, South Golden Beach, New Brighton)	Ocean Shores (Rising Road Access) South Golden Beach (Low Flood Island) New Brighton (Low Flood Island)	3313	Approximately 614 properties in Ocean Shores, 352 in South Golden Beach and 192 in New Brighton are at risk of inundation.

1. BYRON BAY SECTOR / COMMUNITY

1.1. BYRON BAY RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Byron Shire for more information about this Sector/Community.

Sector Description	• The Byron Bay Sector is located to the south of Byron Shire, bordering the Mullumbimby Sector to the north-west, Bangalow Sector to the west and the Ballina Shire to the south. • The main population centre of Byron Bay has a population of 10538 people living in 3821 dwellings. • Suffolk Park has a population of 4222 people living in 1463 dwellings.				
Hazard	• Byron Bay is susceptible to overland and local catchment flooding and coastal inundation. • Suffolk Park is susceptible to overland and local catchment flooding and coastal inundation.				
Flood Affect Classification	• Byron Bay has a number of High Flood Islands, and Low Flood Islands with Rising Road Access. Belongil Beach is a High Trapped Perimeter • Suffolk Park has High Flood Islands to the east and west with Low Flood Islands and Rising Road Access in between.				
At risk properties	683	**Total number of properties within Sector/Community**			6525
Sector Control	The Incident Controller will nominate a Sector Commander to control evacuations in this Sector. The NSW SES will conduct evacuations in this sector with assistance from NSW Police, Fire and Rescue NSW, and NSW Rural Fire Service (RFS) volunteers.				
Key Warning Gauge Name	**Name**	**AWRC No.**	**Min (m)**	**Mod (m)**	**Maj (m)**
	• Belongil Creek, 558099 • Tallow Creek, 558098 *There is no forecast gauge for Byron Bay. These two Council gauges form part of Council's Flash Flood Warning System and can provide an indication of potential inundation.	- -	- -	- -	- -
General Strategy	• Evacuation of at-risk population • Self-evacuation to friends/family outside of the impacted area • Establishment of an Assembly Area/Evacuation Centre at **Byron Bay High School** for Byron township and Suffolk Park, and **the Cavanbah Centre** for residents west of Belongil Creek, where evacuees are able to gather while flood situation is monitored.				
Key Risks / Consequences	• Closure of evacuation routes • Inundation of a large number of dwellings. • Potential of isolation of supplies for thousands of people in a large flood event for a number of days. • Ewingsdale Road closure from 20% AEP event will prevent access for Mullumbimby Unit				
	• Flood Watch (BoM) • Flood Warnings (BoM)				

Information and Warnings	• AWS Advice • AWS Watch and Act • AWS Emergency Warning • Sequenced door knocking of evacuation sector • Media announcements (including social media) • Emergency Alerts (SMS, landlines) • Standard Emergency Warning Signal
	• In larger scale evacuations warnings may be accompanied by lights and sirens and evacuation messaging over P.A system on SES vehicles along affected streets.
Property Protection	***Specific property protection measures:*** *Note: Property protection measures for the threat of coastal erosion involves the relocation of readily moveable household goods and commercial stock and equipment. The SES is not responsible for planning or conduct of emergency beach protection works or other physical mitigation works. The Byron Shire Council is responsible for the activation of the Byron Shire Council Coastal Zone Management Plan – Emergency Action Plan.* • Monitoring rising flood waters. • Control of surface water through sandbagging measures. • Monitoring integrity of dwellings surrounded by flood waters.
	Assistance with property protection: • Refer to Chapter 4: Caravan Park Arrangements • Self-serve sandbagging station may be set up at a nominated location to assist with property protection.
	Protection of essential infrastructure: • No identified essential infrastructure requires protection below a PMF event. • Byron Central Hospital is outside of modelled PMF extent.
Evacuation and/or Isolation Triggers	Evacuation may be considered due to; • Inundation of property • Closure of main access routes • Failure of essential services
Evacuation and /or Warning Triggers	All effects listed below associated with gauge heights will need to be monitored and verified via reconnaissance wherever possible and should not be considered as absolute. Different sources of flooding within the Byron Bay Sector may affect consequences including tidal influences which need to be considered in relation to warnings from Council's Flood Warning System. Note that these predictions are based on Council's Flood Warning System, in the context of the Belongil Creek and Tallow Creek Intermittently Closed and Opening Lakes and Lagoons (ICOLL) being closed. If warnings are received via the Flood Warning System consultations are recommended with Council to determine the status of these ICOLL's and discuss these predictions, and if Council will be activating their ICOLL opening licenses. The Byron township and the southern part of Suffolk Park are suspectable to flooding from stormwater runoff exceeding drainage system capacity and may require monitoring during periods of predicted heavy rainfall. Note that the Cavanbah Centre is outside the modelled 1% flood extent but would be vulnerable during a PMF event (approximately 3.66 mAHD at this location). If a PMF

	event is predicted to occur west of the Belongil Creek Bridge, the Incident Controller will need to select the best available alternative Evacuation Centre. Alternate egress to the Pacific Motorway via Ewingsdale Road *may* be cut at 2.6m at the Belongil Creek Gauge. **Evacuation or warning will be considered for Byron Bay when:** • **1.) Prediction to reach and/ or exceed 1.8 m at Belongil Creek Gauge:** • Discovery Park may see the onset of flooding at this height and is predicted to be completely inundated by 2.8m (Subsector Byron Bay Discovery Park). • **2.) Prediction to reach and/ or exceed 2.1 m at Belongil Creek Gauge:** Ewingsdale Road may have a 770m stretch flooded up to depths of 35cm cutting off the Byron Bay Industrial area from the township at this height. • Childe St and Giaour St (Subsector Belongil Beach) may become inundated at this height with above floor inundation beginning from 2.1m for two properties with 13 predicted to be inundated by 2.8m. Road egress via Childe Street may be cut at this point with up to 30cm depth over roads with Shirely St likely being cut at 2.8m. • The area from the Byron Bay Visitor Centre towards Burns Street in the west is a High Flood Island predicted to be isolated above the modelled PMF event (Subsector Byron Bay U). • The area along Gordon Street and Little Burns Street is within the 1% AEP flood extent and *may* experience some inundation from 2.1m (Subsector Byron Bay Central West). • **T**here may be some inundation in low lying areas at 2.12m to the south of Ewingsdale Road between the Belongil Creek bridge and Ewingsdale. There is Rising Road Access and Overland Escape Routes to the Cavanbah Centre. (Subsectors Belongil Swamp A, Cumbebin Swamp West and Byron Bay West). The Byron Bay West Subsector includes the Belongil Fields Caravan Park. • Inundation *may* occur at the Glen Villa Resort from a 5% AEP event at approximately 2.2m routes may be cut at 2.9m and (Subsector Glen Villa Resort). • **3.) Prediction to reach and/ or exceed 2.6 m at Belongil Creek Gauge:** The Byron CBD is largely within the 20% AEP flood extent, and *may* begin to experience inundation from this height, beginning along Lawson Street, Lateen Lane, Byron Street, Middleton Street, Marvel Street and Marvel Lane (Subsector Byron Township). By 3.15m extensive inundation of major access roads into Byron township is predicted including Ewingsdale Road, Shirely Street, Butler Street and Jonson Street, with limited access to supermarkets due to flooding along Jonson Street. The primary evacuation route along Jonson Street may be cut at this height but there is an alternative route available. • At 2.9m the evacuation route along Bangalow Road *may* be cut. Up to 156 properties may be flooded above floor level at this height. • The Sunrise area may experience inundation from a 20% AEP event, approximately 2.65m (Subsector Sunrise). This area includes the Elements of Byron Resort with 202 villas, which experienced above ground inundation in 2022. Evacuation is still possible to the Cavanbah Centre via local roads. • The Byron Bay Industrial area may become isolated at approximately 2.75m but is outside of the modelled PMF extent (Subsector Byron Bay Industrial Estate).

	• The area near Byron Bay War Memorial is a High Flood Island up until the PMF event approximately 2.77m but may be cut off due to road closure of Marvel St at 2.72m (Subsector Byron B). • Approximately 36 low-lying properties along Shirley Street may have over flood inundation from 2.8m and access to evacuation routes may be compromised along Shirley Street (Subsector Cumbebin Swamp). • The area between Browning Street and Old Bangalow Road is within the PMF flood extent and may experience inundation from this approximately 2.8m (Subsector Byron South Central). • Ewingsdale Road and Shirley St are inundated at this 2.8m up to depths of 1m. • **4.) Prediction to reach and/ or exceed 3.15 m at Belongil Creek Gauge:** Note that at this height there may be extensive inundation of major access roads into Byron township including Ewingsdale Road, Shirely Street, Butler Street and Jonson Street, with limited access to supermarkets due to flooding along Jonson Street. Up to 156 properties may be flooded above floor level at this height (Subsector Byron Township). The primary evacuation route from Byron Bay CBD may become cut at this height. Triggers for this prediction are incorporated within Prediction 3 above. • **5.) Prediction to reach and/ or exceed 3.63 m at Belongil Creek Gauge:** The Lilli Pilli area is partially within the PMF flood extent at this approximate height but has Rising Road Access along Old Bangalow Road. • The southern part of the Byron Bay Industrial Estate is within the 20% AEP flood extent and *may* experience inundation from approximately 3.95m along Brigantine Street, Bayshore Drive and Grevillea Street (Subsector Byron Bay Industrial Estate). **Evacuation or warning will be considered for Suffolk Park when:** • **1.) Prediction to reach and/ or exceed 2.6m at Tallow Creek Gauge:** Onset of flooding to villa as Crystalbrook Byron may occur at this height (Subsector Western Tallow Creek) • **2.**) **Prediction to reach and/ or exceed 3.5m at Tallow Creek Gauge:** Onset of flooding to houses on east bank of Tallow Creek at this height with up to 30 houses inundated above floor level at this height. This inundation is predicted to extend from Tallow Creek to Kalemajere Drive, inundating an additional 50 houses above floor level at 3.75m (Subsector Tallow Creek East). • The area to the east between Armstrong Street and Alcorn Street is a High Flood Island which may become isolated if access along Clifford St towards Broken Head Road is compromised during localised flooding (Subsector Suffolk Park B). • **3.) Prediction to reach and/ or exceed 5.52m at Tallow Creek Gauge:** This area is outside of the modelled PMF extent but may become isolated by local road closures (Subsector Suffolk Park D). For other parts of the Byron Bay Sector, flooding may be due to localised flooding of upper Tallow Creek catchment areas and stormwater runoff due to inadequate drainage. • The eastern part of Baywood Chase in Suffolk Park west of Broken Head Road is largely within the 20% AEP flood extent and *may* experience inundation from local creek flooding

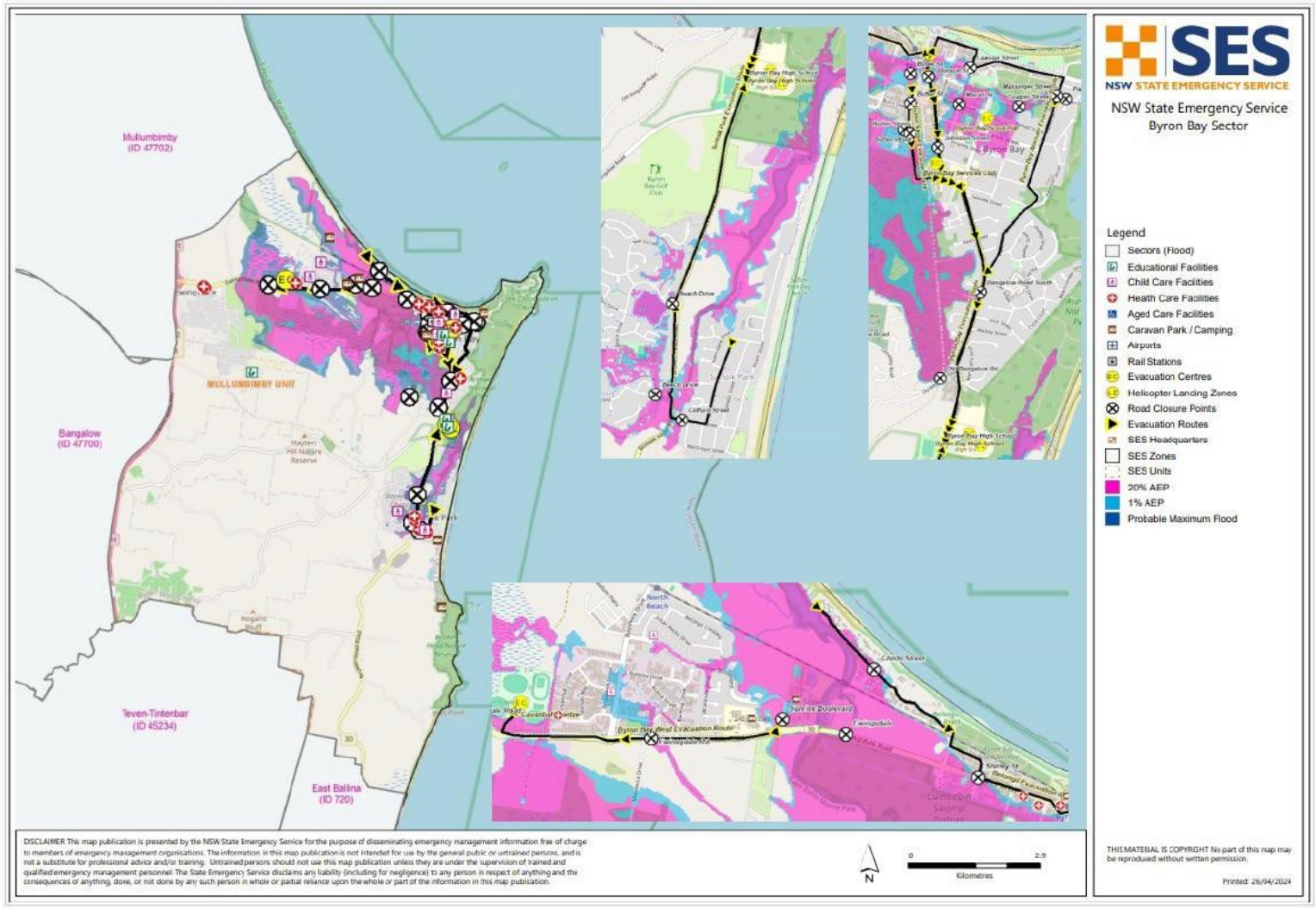
	• It may also experience inundation during periods of heavy rainfall as a result of stormwater runoff exceeding drainage capacity (Subsector Baywood Chase East). This area includes the Bayside at Byron aged care facility and Suffolk Park childcare centre, but Rising Road Access to higher ground is available. Monitoring of the stormwater culverts in front of the Shell Service station on Broken Head is recommended to determine the potential for water level rises and inundation of property before evacuation to higher ground is considered. • The northern part of Baywood Chase is a High Flood Island (Subsector Baywood Chase) in this scenario and has high ground for temporary evacuation of Subsector Baywood Chase East if required.
Sequencing of warnings and evacuation	**Byron Bay Evacuation Sequencing** • Evacuation of vulnerable facilities such as aged care facilities, schools, and child-care facilities will require a higher priority. • **For Prediction 1:** Watch and Act messaging for Subsector Byron Bay Discovery Park (GEMS ID 45223) if heights are expected to reach 1.8m and Emergency Warning evacuation messaging if heights are expected to reach or exceed 2.8m. • **For Prediction 2:** Emergency Warning evacuation messaging for Subsector Belongil Beach (GEMS ID 65363) if heights are expected to reach or exceed 2.1m. • Watch and Act isolation messaging for Subsector Byron Bay U (GEMS ID 45236) if heights are expected to reach or exceed 2.1m. • Watch and Act isolation messaging for Subsector Byron Bay Central West (GEMS ID 65628) if heights not expected to exceed 2.1m and Emergency Warning evacuation messaging if heights expected to exceed 2.9m. These actions should only be taken following active monitoring of conditions as prediction is based on known flood extent but not depths. • Watch and Act messaging for low-lying areas in Subsectors Belongil Swamp A (GEMS ID 45228), Cumbebin Swamp West (GEMS ID 45212) and Byron Bay West (GEMS ID 65632), including Belongil Fields Caravan Park if heights are expected to reach 2.12m and Emergency Warning evacuation messaging if heights are expected to exceed 2.12m. • Watch and Act prepare to isolate for Subsector Glen Villa Resort (GEMS ID 65626) if heights not expected to exceed 2.2m and Emergency Warning evacuation messaging if heights expected to reach or exceed 2.9m. These actions should only be taken following active monitoring of conditions as prediction is based on known flood extent but not depths. • **For Prediction 3:** Watch and Act prepare to evacuate messaging for Subsector Byron Township (GEMS ID65624) is heights are expected to reach 2.6m and Emergency Warning evacuation messaging if heights are expected to reach or exceed 2.9m. • Watch and Act messaging for Subsector Sunrise (GEMS ID65623) including Elements of Byron Resort if heights are expected to reach 2.65m and Emergency Warning evacuation messaging if heights expected to exceed 2.65m. These actions should only be taken following active monitoring of conditions as prediction is based on known flood extent but not depths. • Watch and Act prepare to isolate messaging for Subsector Byron Bay Industrial Estate (GEMS ID 45229) if heights are expected to reach or exceed 2.75m.

	• Watch and Act prepare to isolate messaging for Subsector Byron B (GEMS ID 44803) if heights are expected to reach 2.72m and Emergency Warning evacuation messaging if expected to exceed 2.77m. • Watch and Act messaging for Subsector Cumbebin Swamp (GEMS ID 65365) if heights expected to reach 2.8m and Emergency Warning evacuation messaging if expected to reach or exceed 2.8m. • Watch and Act messaging for Subsector Byron South Central (GEMS ID 65631) if heights are not expected to reach 2.8m and Emergency Warning evacuation messaging if heights are expected to exceed 2.8m. These actions should only be taken following active monitoring of conditions as prediction is based on known flood extent but not depths. • **For Prediction 4:** Sequencing for this prediction when major roads are cut has been incorporated throughout Prediction 4 sequencing sequential above. • **For Prediction 5:** Watch and Act messaging for Subsector Lilli Pilli (GEMS ID 45607) if heights are expected to reach 3.63m and Emergency Warning evacuation messaging if heights are expected to exceed 3.63m, the approximate height for a PMF event. This action should only be taken following active monitoring of conditions as prediction is based on known flood extent but not depths. • Watch and Act messaging for Subsector Byron Bay Industrial Estate South (GEMS ID 45218) if heights are expected to reach 3.95m and Emergency Warning evacuation messaging if heights are expected to exceed 3.95m. These actions should only be taken following active monitoring of conditions as prediction is based on known flood extent but not depths. **Suffolk Park Evacuation Sequencing** • Evacuation of vulnerable facilities such as aged care facilities, schools, and child-care facilities will require a higher priority. • **For Prediction 1**: Watch and Act messaging for Subsector Western Tallow Creek (GEMS ID 65366) including Crystalbrook Byron Bay resort if heights are expected to reach 2.6m and Emergency Warning evacuation messaging if heights are expected to exceed 2.6m. • **For Prediction 2:** Emergency Warning evacuation messaging for Subsector Tallow Creek East (GEMS ID 65367) if heights are expected to reach or exceed 3.5m. • Watch and Act prepare to isolate messaging and do enter flood water for Subsector Suffolk Park B (GEMS ID 46407) if reconnaissance indicates Clifford Street may be cut. • **For Prediction 3:** Watch and Act prepare to isolate messaging for Subsector Suffolk Park D (GEMS ID 65634) heights are expected to reach or exceed 5.52m. • **For upstream areas of Suffolk Park**, on the western side of Broken Head Road, Watch and Act do not enter floodwater messaging for Subsector Baywood Chase East (GEMS ID 62850) if monitoring indicates rising water levels from stormwater runoff along Broken Head Road and Emergency Warning move to higher ground messaging if monitoring indicates rapid water level rises. • Watch and Act prepare to isolate messaging and do enter flood water for Subsector Baywood Chase (GEMS 46408) if monitoring indicates rapid water level rises along Broken Head Road.

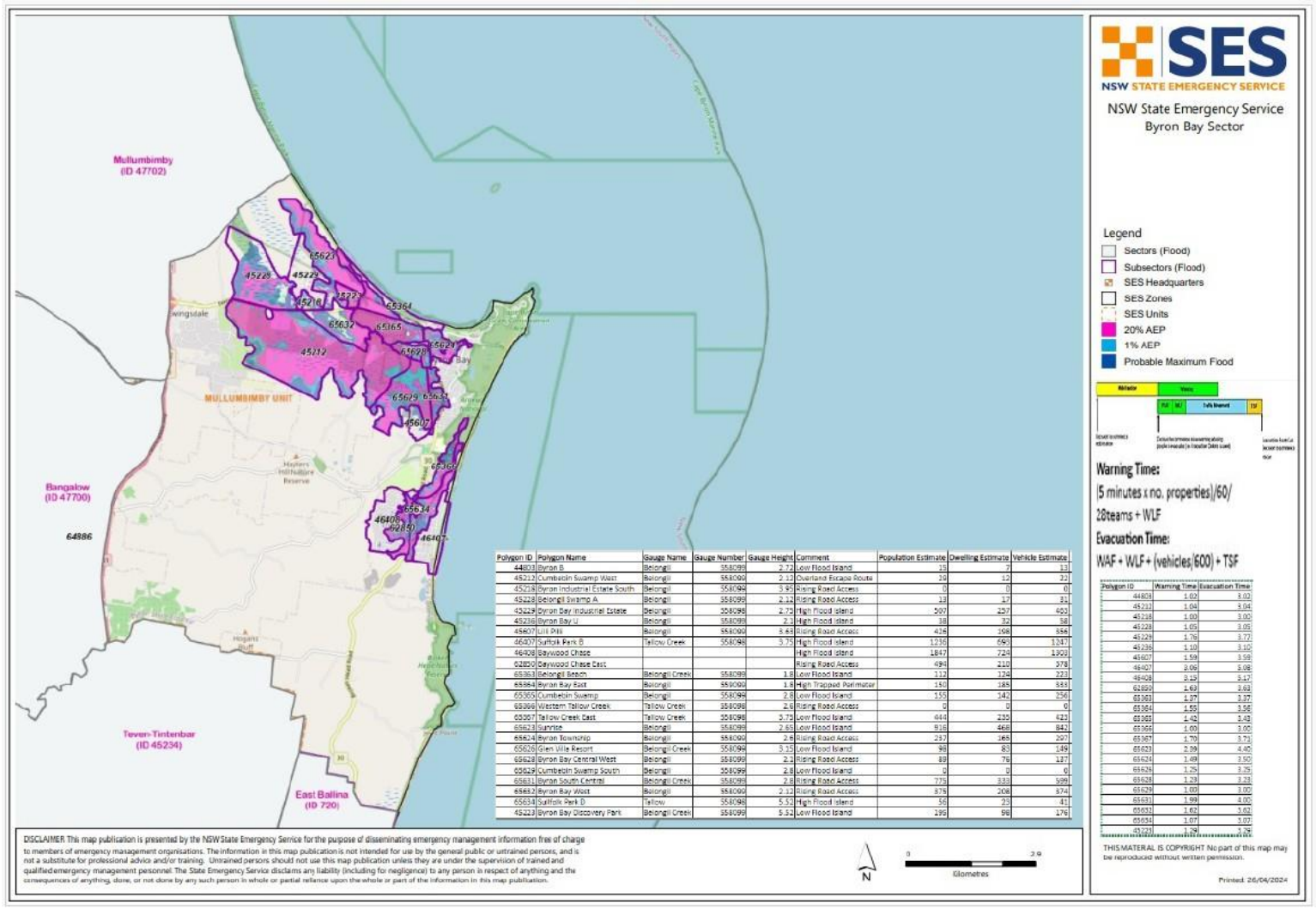
Evacuation Routes	• **Byron Bay West Evacuation Route:** Sunrise Boulevard - Ewingsdale Road – Cavanbah Centre • **Butler Street Evacuation Route:** Butler Street – Browning Street - Jonson Street – Bangalow Road – Byron Bay High School • **Belongil Evacuation Route:** Childe Street –-Border Street – Kendall Street – Cavanbah Street – Dryden Street – Shirley Street – Jonson Street– Bangalow Road – Byron Bay High School • **Byron Bay Evacuation Route:** Jonson Street – Browning Street – Bangalow Road – Byron Bay High School • **Byron Bay Alternate Evacuation Route:** Jonson Street – Bay Street – Middleton Street – Lawson Street – Massinger Street – Ruskin Street – Patterson Street – Bangalow Road – Byron Bay High School • **Suffolk Park Evacuation Route:** Armstrong Street – Clifford Street – Broken Head Road – Bangalow Road – Byron Bay High School
Evacuation Route Closure	• **Byron Bay West Evacuation Route:** Ewingsdale Road east of Melaleuca Drive at 3.52m. Intersection of Ewingsdale Road and Sunrise Boulevard at 2.2m. • **Butler Street Evacuation Route:** Butler Street may be cut at 3.15m. • **Belongil Evacuation Route:** Intersection of Childe and Giaour Street at 1.8m. • **Byron Bay Evacuation Route:** Jonson Street at 3.15m. Bangalow Road (south of Cumbebin Park) at 2.9m. • **Byron Bay Alternate Evacuation Route:** The intersection of Lawson Street and Middleton Street may be cut at 2.72m. Massinger Street may be cut due to local stormwater runoff. • **Suffolk Park Evacuation Route** Clifford Street may be cut at 4.48m. The intersection of Bangalow Road and Beech Drive may also be cut due to local stormwater runoff.
Method of Evacuation	• Primarily self-evacuation by private transport to higher ground • Primarily self-evacuation by private transport to evacuation centres/assembly areas
Evacuation Centre/Assembly Point	• Byron Bay High School. Primary evacuation centre for Byron Bay township and Suffolk Park. • Byron Bay Scout Hall (within PMF flood extent). • Byron Bay Services Club (within PMF flood extent). • Cavanbah Centre (Alternate EOC) inundated in a PMF event, isolated from 5% AEP. Primary evacuation centre for Sunrise area and Byron Bay Industrial Estate.
Large scale evacuations	• When large-scale evacuations are likely, the NSW SES Incident Controller will liaise with the LEOCON and request support of the EOC as required. Large scale evacuations would be unlikely in this sector but if required additional locations will be identified. • Additional locations may be identified in large scale evacuations, or if existing evacuation centres are flood affected or isolated. • Assembly areas may be utilised on higher ground.
Rescue	• The flood rescue management process adopted will be determined by the Incident Controller, based on the scale of the flood rescue operations. • The Incident Controller may declare a flood rescue area of operations and establish a flood cell to assist with the management of flood rescues. • Flood Rescue Operations will be undertaken as per the State Rescue Policy.

Resupply	• Resupply is unlikely to be required in this sector until floods exceed the 1% AEP level. • If resupply is required, it may be provided by the NSW SES through the 132500 call out system.
	• If flood waters have not receded within 2-3 days, the following isolated Subsectors may require resupply: Byron Bay Industrial Estate (257 properties), Byron Bay U (63 properties), Lilli Pilli (198 properties), Suffolk Park D (23 properties), Baywood Chase (724 properties) and Suffolk Park B (693 properties).
	Table 19, in Volume 2 provides information about isolated communities in the Byron Shire area and potential periods of isolation.
Aircraft Management	***Helicopter Landing Points:*** Suitable landing points are located at: • Byron Bay High School 28.6677° S 153.6161° E
	Airports: • There are no airports in this sector. The closest airport is located in the Ballina Shire LGA.
Other	• Byron Bay has a large homeless population of approximately 200 people. • Byron Bay also holds a large number of annual events including Bluesfest in late March, Byron Triathlon in May, Byron Comedy Festival and Byron Musical Festival in June, Splendour in the Grass in July, Surf Festival in August, and the International Film Festival in October. • Closure of schools - coordinated through the Department of Education and Training. • The evacuation of domestic animals, horses and livestock to the appropriate facility to be managed by Department of Primary Industries and Local Land Services. • Closure of licensed premises. All hotels and licensed clubs will be closed if required. • Security. Police patrols to be established to maintain law and order after evacuation has occurred. • The NSW SES will use flood boats, aircraft, community contacts and other agencies to monitor the safety of individuals, where feasible. • These arrangements will stay in place until the “Return with Caution” is provided by the NSW SES to residents to return to their premises.

1.2. BYRON BAY SECTOR/COMMUNITY MAP



1.3. EVACUATION PLANNING



Polygon ID	Polygon Name	Gauge Name	Gauge Number	Gauge Height	Comment	Population Estimate	Dwelling Estimate	Vehicle Estimate
44803	Byron B	Belongil	558095	2.72	Low Flood Island	19	7	13
45212	Cumbebin Swamp West	Belongil	558090	2.13	Overland Escape Route	19	12	22
45218	Byron Industrial Estate South	Belongil	558094	3.9	Rising Road Access	0	0	0
45228	Belongil Swamp A	Belongil	558095	2.12	Rising Road Access	13	17	31
45229	Byron Bay Industrial Estate	Belongil	558098	2.72	High Flood Island	507	257	603
45238	Byron Bay U	Belongil	558095	2.3	High Flood Island	38	32	58
45607	Lot Pitt	Belongil	558090	3.63	Rising Road Access	426	198	556
46407	Suffolk Park B	Tallow Creek	558098	3.75	High Flood Island	1236	690	1247
46408	Baywood Chase				High Flood Island	1847	724	1303
62899	Baywood Chase East				Rising Road Access	494	210	378
65363	Belongil Beach	Belongil Creek	558089	1.8	Low Flood Island	112	124	223
65364	Byron Bay East	Belongil	559092	1.8	High Trapped Perimeter	150	185	333
65365	Cumbebin Swamp	Belongil	558094	2.8	Low Flood Island	155	142	256
65366	Western Tallow Creek	Tallow Creek	558098	2.6	Rising Road Access	0	0	0
65367	Tallow Creek East	Tallow Creek	558098	3.75	Low Flood Island	444	235	423
65623	Sunrise	Belongil	558099	2.65	Low Flood Island	818	468	842
65624	Byron Township	Belongil	558090	2.6	Rising Road Access	297	165	297
65626	Glen Villa Resort	Belongil Creek	558094	3.15	Low Flood Island	98	83	149
65628	Byron Bay Central West	Belongil	558095	2.1	Rising Road Access	89	79	127
65629	Cumbebin Swamp South	Belongil	558095	2.8	Low Flood Island	0	0	0
65631	Byron South Central	Belongil Creek	558089	2.8	Rising Road Access	775	333	599
65632	Byron Bay West	Belongil	558090	2.12	Rising Road Access	875	208	374
65634	Suffolk Park D	Tallow	558098	5.52	High Flood Island	56	23	41
45223	Byron Bay Discovery Park	Belongil Creek	558095	5.52	Low Flood Island	195	98	176

Polygon ID	Warning Time	Evacuation Time
44803	1.02	3.02
45212	1.04	3.04
45218	1.00	3.00
45228	1.03	3.05
45229	1.76	3.72
45238	1.10	3.10
45607	1.59	3.59
46407	2.06	3.08
46408	2.15	3.47
62899	1.63	2.93
65363	1.27	3.37
65364	1.55	3.56
65365	1.42	3.43
65366	1.60	3.90
65367	1.70	3.73
65623	2.39	4.40
65624	1.49	3.50
65626	1.25	3.25
65628	1.23	3.23
65629	1.00	3.00
65631	1.99	4.00
65632	1.62	3.62
65634	1.07	3.07
45223	1.76	3.76

2. BANGALOW SECTOR / COMMUNITY

2.1. BANGALOW RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Byron Shire for more information about this Sector/Community.

Sector Description	• Bangalow Sector is located to the west of the Byron Bay Sector and borders the Ballina Shire to the south and Lismore City to the west. • The main population centre of Bangalow has a population of 2260 people living in 758 dwellings.		
Hazard	Bangalow may be affected by riverine flooding from the Wilsons River, Byron Creek and Paddy's Creek. Huonbrook and Upper Wilsons Creek are at risk of isolation from flooding occurring in the adjacent Mullumbimby Sector.		
Flood Affect Classification	Bangalow is a High Flood Island Upper Wilsons Creek and Huonbrook is a High Flood Island		
At risk properties	240	**Total number of properties within Sector/Community**	2266
Sector Control	The Incident Controller will nominate a Sector Commander to control evacuations in this Sector. The NSW SES will conduct evacuations in this sector with assistance from NSW Police, Fire and Rescue NSW, and NSW Rural Fire Service (RFS) volunteers.		

Key Warning Gauge Name	**Name**	**AWRC No.**	**Min (m)**	**Mod (m)**	**Maj (m)**
	Mullumbimby *There is no forecast gauge for Bangalow, however the Mullumbimby Gauge can provide an indication for isolation in the northern part of the Bangalow Sector.	202402	2.5	3.5	4.5

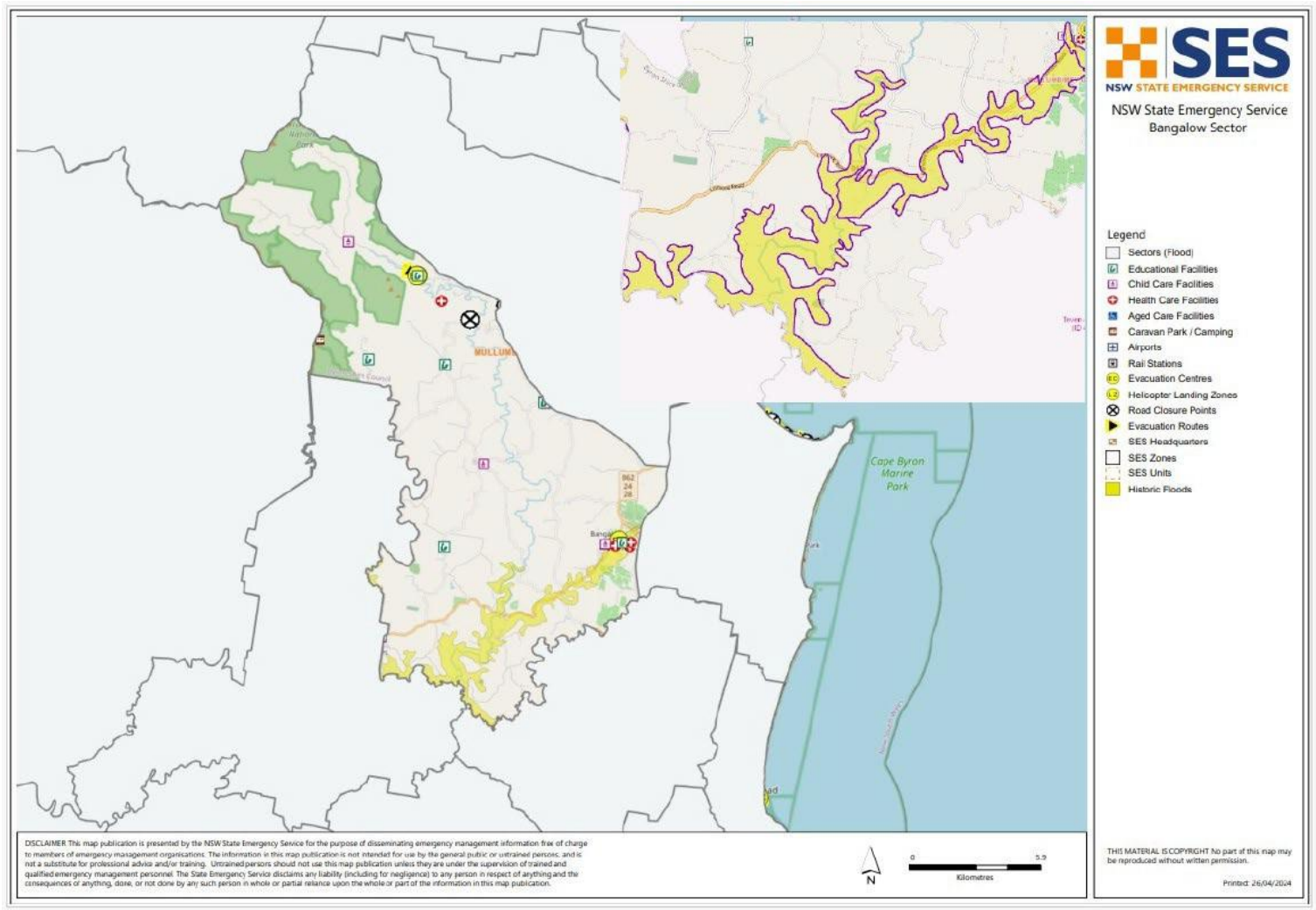
General Strategy	• Evacuation of at-risk population. • Self-evacuation to friends/family outside of the impact area. • Establishment of an Assembly Area/Evacuation Centre at **Bangalow A&I Hall** where evacuees are able to gather while flood situation is monitored.
Key Risks / Consequences	• Isolation for communities in Upper Wilsons Creek and Huonbrook • Inundation of main access routes • Potential loss of life from inundation • Inundation of a small number of dwellings and businesses • Potential isolation of other communities, such as Eureka and Federal, due to flood related effects including landslips
Information and Warnings	• Flood Watch (BoM) • Flood Warnings (BoM) • AWS Advice • AWS Watch and Act • AWS Emergency Warning • Sequenced door knocking of evacuation sector • Media announcements (including social media)

	• Emergency Alerts (SMS, landlines) • Standard Emergency Warning Signal
	• Door knocking suitable for smaller areas or a sequential approach to evacuation, due to the relatively small number of affected properties in this sector.
Property Protection	***Specific property protection measures:*** • Control of surface water through sandbagging measures. • Monitoring integrity of dwellings surrounded by flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods
	Assistance with property protection: • Refer to Chapter 4: Caravan Park Arrangements
	Protection of essential infrastructure: • No identified essential infrastructure requires protection below a PMF event.
Evacuation and/or Isolation Triggers	Evacuation may be considered for floods that are expected to cause; • Closure of main evacuation routes prior to Inundation • Property inundation • Failure of essential services
Evacuation Triggers	Evacuation will be considered when: • **1.) Prediction to reach and/or exceed 3.5m at the Mullumbimby Gauge:** Wilsons Creek Rd is cut near Mullumbimby Golf Club, isolating residents in Subsector Upper Wilsons Creek and Huonbrook. For other areas of the Bangalow Sector, evacuation sequencing is based on expected road inundation of main access road low points. Therefore, evacuation may be considered when; • 2.) Flood levels exceed approx. 22.3mAHD at the Lismore Road Crossing of the Wilsons River between Taylors Rd and Booyung Rd Approx 0.3m of water over the road at this low point may close this route, isolating the Nashua from the Bangalow township (Subsector Nashua). • 3.) Flood levels exceed approx. 43mAHD at the Lismore Road Crossing of Paddys Creek to the Southwest of Bangalow Township. Approx 0.3m of water over the road at this low point may close this route, isolating the Binna Burra from the Bangalow township (Subsector Binna Burra). • 4.) Flood levels exceed approx. 42.7mAHD at the entrance to the Pacific Motorway On-Ramp in the Bangalow Township. Approx 0.3m of water over the road at this low point may close this route, preventing access to the Pacific Motorway for Bangalow (Subsector Bangalow Town).
Sequencing of evacuation	• Evacuation of vulnerable facilities such as the hospital, aged care facilities, schools, and child-care facilities will require a higher priority. • Outside of the identified sequenced evacuation areas, a number of residences and properties may need to be evacuated during periods of significant flooding. In most floods, the evacuation tasks will only involve a small number of people.

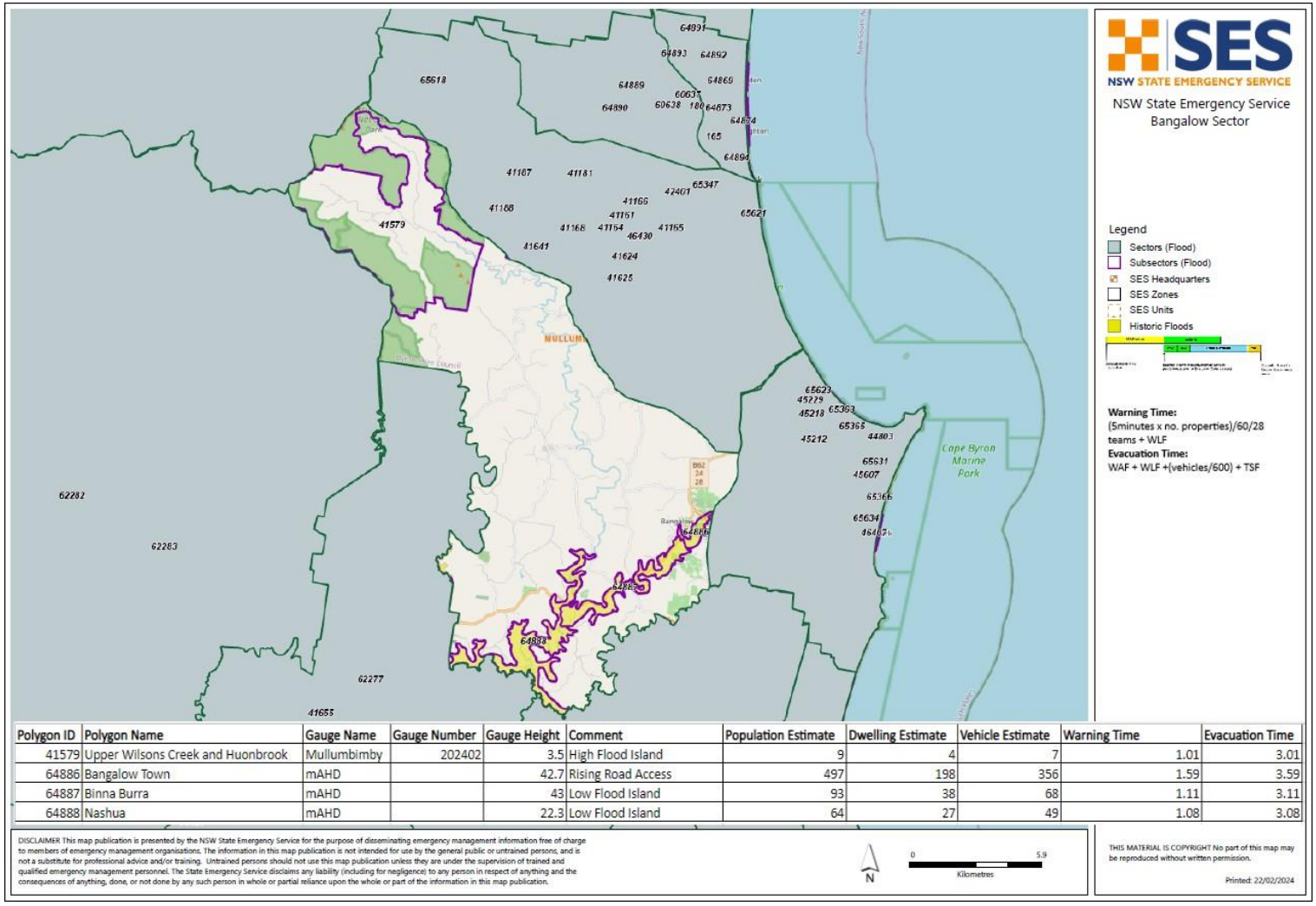
	Mullumbimby Gauge 1.) **For Prediction 1:** Watch and Act prepare to isolate messaging for the Subsector Upper Wilsons Creek and Huonbrook (GEMS ID 41579) if heights are expected to reach or exceed 3.5m at the Mullumbimby Gauge. *Other Sequencing* 2.) **For Predictions 2-4:** Watch and Act messaging should be considered for isolation or potential inundation for Subsectors Nashua (GEMS ID 64888), Binna Burra (GEMS ID 64887) and Bangalow Town (GEMS ID 64886). Due to the lack of gauging in the area, this needs to be verified by reconnaissance of flood levels and road closure points.
Evacuation Routes	If evacuation is necessary, the following routes may be taken. • **Upper Wilsons Creek and Huonbrook:** Wilsons Creek Rd to Wilsons Creek Hall and Wilsons Creek Public School. • **All other subsectors:** Lismore Rd to Station St to A&I Hall, Bangalow.
Evacuation Route Closure	The following closures may affect the above routes*; • Lismore Road Crossing of the Wilsons River between Taylors Rd and Booyong Road at peak heights of approx. 22.3mAHD. • Lismore Road Crossing of Paddys Creek to the southwest of Bangalow Township at peak heights of approx. 43mAHD. **Other closures not listed above may also affect these routes and need to be monitored.*
Method of Evacuation	• Primarily self-evacuation by private transport to higher ground within the Bangalow Sector. • Primarily self-evacuation by evacuation via private transport to evacuation centres private transport to evacuation centres/assembly areas.
Evacuation Centre/Assembly Point	• A&I Hall, 3 Station St, Bangalow. • Wilsons Creek Hall • Wilsons Creek Public School
Large scale evacuations	• When large-scale evacuations are likely, the NSW SES Incident Controller will liaise with the LEOCON and request support of the EOC as required. Large scale evacuations would be unlikely in this sector but if required additional locations will be identified. • Additional locations may be identified in large scale evacuations, or if existing evacuation centres are flood affected or isolated. • Assembly areas may be utilised on higher ground
Rescue	• The flood rescue management process adopted will be determined by the Incident Controller, based on the scale of the flood rescue operations. • The Incident Controller may declare a flood rescue area of operations and establish a flood cell to assist with the management of flood rescues. • Flood Rescue Operations will be undertaken as per the State Rescue Policy
Resupply	• Resupply is unlikely to be required in this sector until floods exceeding 3.55 at the Mullumbimby Gauge, cutting Wilsons Creek Road and isolating properties in Upper Wilsons Creek, Wanganui and Huonbrook. • If resupply is required, it will be provided by the NSW SES through the 132500 call out system.
	The following communities may be at risk of isolation and require resupply. • Upper Wilsons Creek, approximately 38 dwellings and 79 people.

	• Huonbrook, approximately 152 dwellings and 238 people. • Wanganui, approximately 21 dwellings. • Eureka, approximately 153 dwellings and 353 people. • Federal, approximately 344 dwellings and 784 people.
	Table 19, in Volume 2 provides information about isolated communities in the Byron Shire area and potential periods of isolation.
Aircraft Management	***Helicopter Landing Points:*** There are no designated landing points in this sector.
	Airports: There are no airports in this sector. The closest airport is located in the Ballina Shire LGA.
Other	Special considerations relating to evacuation: • Closure of schools - coordinated through the Department of Education and Training. • The evacuation of domestic animals, horses and livestock to the appropriate facility to be managed by Department of Primary Industries and Local Land Services. • Closure of licensed premises. All hotels and licensed clubs will be closed if required. • Security. Police patrols to be established to maintain law and order after evacuation has occurred. • The NSW SES will use flood boats, aircraft, community contacts and other agencies to monitor the safety of individuals, where feasible. • These arrangements will stay in place until the "Return with Caution" is provided by the NSW SES to residents to return to their premises.

2.2. BANGALOW SECTOR/COMMUNITY MAP



2.3. EVACUATION PLANNING



Polygon ID	Polygon Name	Gauge Name	Gauge Number	Gauge Height	Comment	Population Estimate	Dwelling Estimate	Vehicle Estimate	Warning Time	Evacuation Time
41579	Upper Wilsons Creek and Huonbrook	Mullumbimby	202402	3.5	High Flood Island	9	4	7	1.01	3.01
64886	Bangalow Town	mAHD		42.7	Rising Road Access	497	198	356	1.59	3.59
64887	Binna Burra	mAHD		43	Low Flood Island	93	38	68	1.11	3.11
64888	Nashua	mAHD		22.3	Low Flood Island	64	27	49	1.08	3.08

3. BILLINUDGEL SECTOR / COMMUNITY

3.1. BILLINUDGEL RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Byron Shire for more information about this Sector/Community.

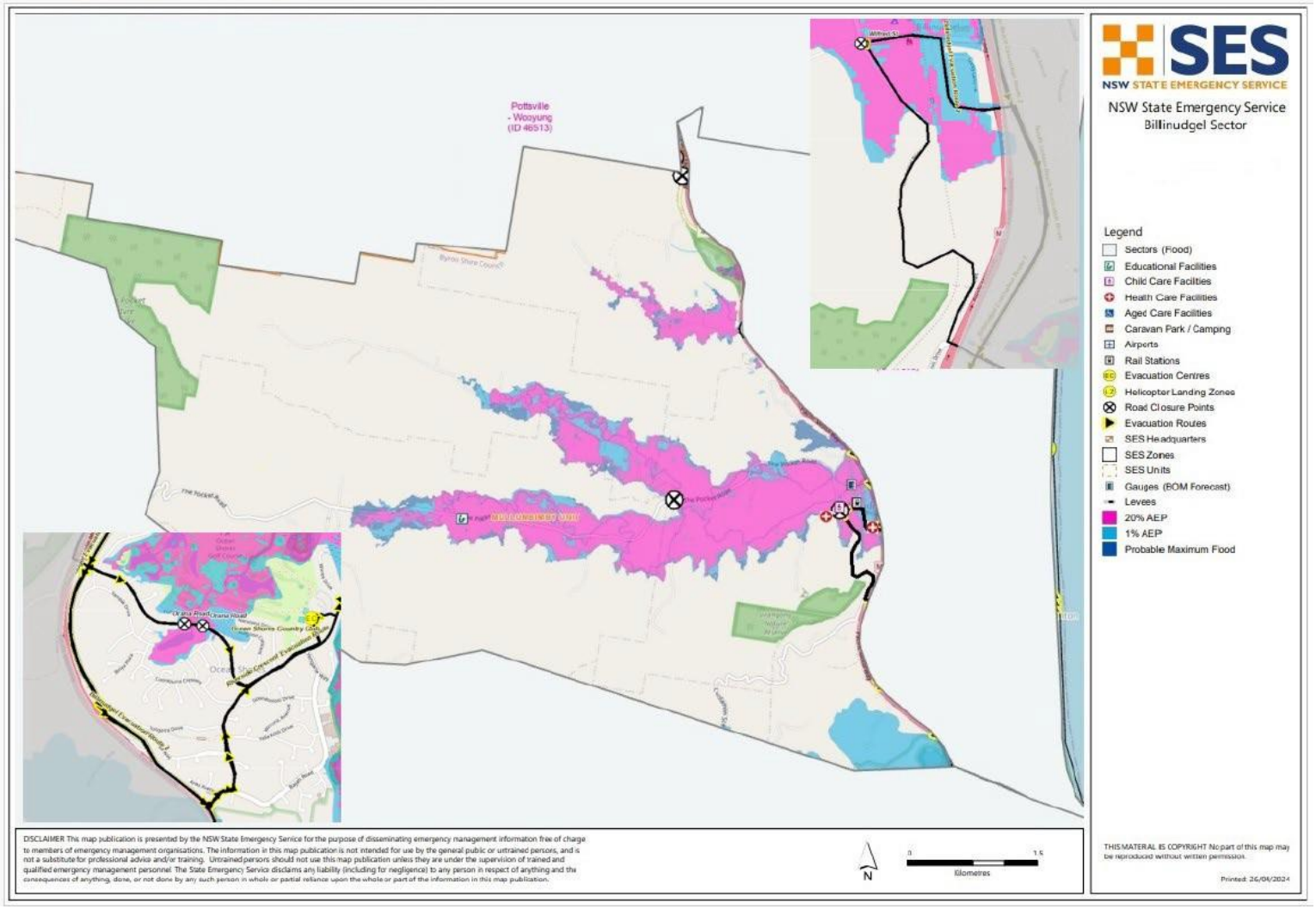
Sector Description	• The Billinudgel Sector is located directly west of the Pacific Motorway and primarily comprised of business and industrial land uses. • Billinudgel has a population of approximately 261 living in 69 dwellings. • The Pocket has a population of 231 people living in 88 dwellings.				
Hazard	Riverine flooding from Lacks and Marshalls Creek.				
Flood Affect Classification	Rising Road Access for Billinudgel Low Flood Island for The Pocket and Middle Pocket				
At risk properties	23	**Total number of properties within Sector/Community**			208
Sector Control	The Incident Controller will nominate a Sector Commander to control evacuations in this Sector. The NSW SES will conduct evacuations in this sector with assistance from NSW Police, Fire and Rescue NSW, and NSW Rural Fire Service (RFS) volunteers.				
Key Warning Gauge Name	**Name**	**AWRC No.**	**Min (m)**	**Mod (m)**	**Maj (m)**
	Billinudgel Gauge	202400	2.5	3.0	3.5
General Strategy	• Evacuation of at-risk population. • Self-evacuation to friends/family outside of the impact area. • Establishment of an Assembly Area/Evacuation Centre at **Ocean Shores Country Club** where evacuees are able to gather while the flood situation is monitored.				
Key Risks / Consequences	• Inundation of a large number of dwellings. • Isolation of the Middle Pocket • Closure of evacuation routes				
Information and Warnings	• Flood Watch (BoM) • Flood Warnings (BoM) • AWS Advice • AWS Watch and Act • AWS Emergency Warning • Sequenced door knocking of evacuation sector • Media announcements (including social media) • Emergency Alerts (SMS, landlines) • Standard Emergency Warning Signal				
Property Protection	***Specific property protection measures:*** • Control of surface water through sandbagging measures. • Monitoring integrity of dwellings surrounded by flood waters.				

	• Relocation of livestock. • Relocation of farm machinery and valuable goods
	Assistance with property protection: • Refer to Chapter 4: Caravan Park Arrangements
	Protection of essential infrastructure: • No identified essential infrastructure requires protection below a PMF event.
Evacuation and/or Isolation Triggers	Evacuation or warning messaging may be considered due to: • Closure of main evacuation routes prior to inundation • Property inundation
Evacuation Triggers	All effects listed below associated with gauge heights will need to be monitored and verified via reconnaissance wherever possible, and should not be considered as absolute. Different sources of flooding within the Billinudgel Sector may affect consequences. Evacuation or warning may be considered when: • **1) Prediction to reach and/ or exceed 1.9m – 2.8m Billinudgel Gauge:** Depending on the timing of the flood and location of rainfall, Wilfred Street may be cut from 1.9m – 2.8m, compromising evacuation routes (Subsector Billinudgel), which may occur within 2.5 hours of the Minor of 2.5m being reached at the Billinudgel Gauge, with above floor inundation predicted to commence at 3.5m. Egress north of Wilfred St via Brunswick Street *may* also be cut at this height (Subsector Marshalls Creek A). • There may be water over The Middle Pocket Road isolating some rural properties (Subsector Middle Pocket Road). There may be water over The Pocket Road isolating some rural properties (Subsectors The Pocket Road East, The Pocket Road West). • Note that due to the possibility of evacuation routes being compromised within a 2.5 hour timeframe of Minor being reached, it is recommended that Wilfred Street and Brunswick Street are monitored if a Minor is predicted. For other areas of the Billinudgel Sector, sequencing is based on expected road inundation of main access road low points. Therefore, evacuation may be considered when; • **2.) Prediction to reach and/ or exceed 4.7m AHD:** The area along Yelgun Road west of the Pacific Motorway may become inundated from this height (Subsector Yelgun Road) and the areas to the southwest of Yelgun Road may become isolated (Subsector Yelgun South).
Sequencing of evacuation	• Evacuation of vulnerable facilities such as The Pocket Public School and Billi Kids Long Day Care Centre will require a higher priority. *Billinudgel Gauge* • **For Prediction 1:** Watch and Act isolation messaging for Subsectors Billinudgel (GEMS ID 180) and Marshall Creek A (GEMS ID 60637), if heights not expected to exceed 1.9m and Emergency Warning evacuation messaging if heights are expected to exceed 3.5m, before evacuation routes potentially compromised from 1.9m. • Watch Act prepare to isolate and do enter floodwater messaging for Subsectors Middle Pocket Road (GEMS ID 64889), The Pocket Road West (GEMS ID 64890) and Pocket Road East (GEMS ID 64889). *Other Sequencing* • **For Prediction 2**: Watch and Act messaging for Subsector Yelgun Road (GEMS ID 62827), if heights expected to reach 4.7m AHD and

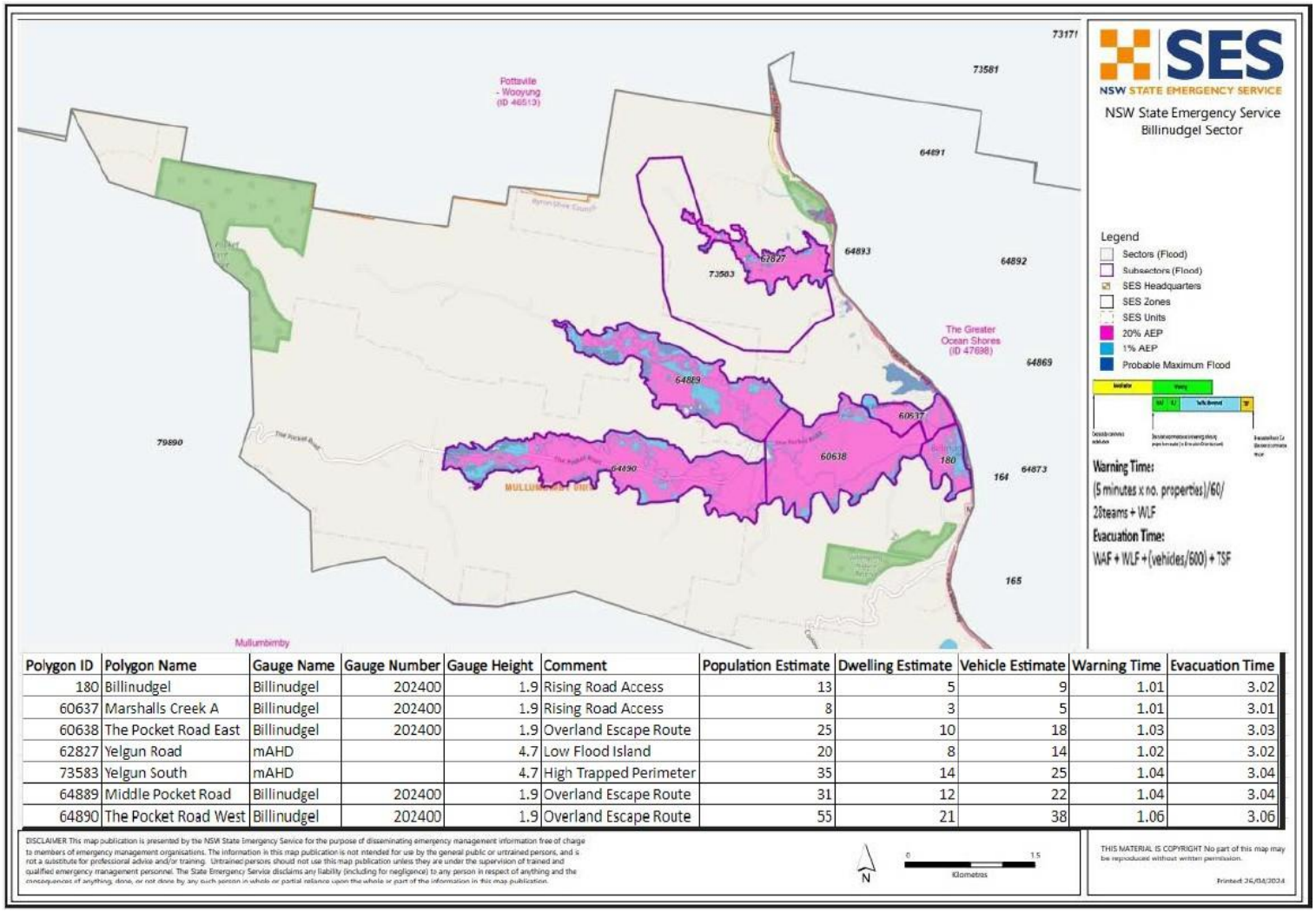
	Emergency Warning evacuation messaging if heights are expected to exceed 4.7m AHD. • Watch and Act prepare to isolate messaging for Subsector Yelgun South (GEMS ID 73583), if heights expected to reach 4.7m AHD
Evacuation Routes	• **Route 1 From Billinudgel:** Wilfred St- Bonanza Drive – Brunswick Valley Way – Orana Road • **Route 2 from Billinudgel:** Wilfred St – Bonanza Drive - Brunswick Valley Way – Rajah Road – Warrambool Road – Orana Road • **Route 3 from Billinudgel:** Wilfred St – The Tunnel Road – Stock Route Road – Orana Rd – Brunswick Valley Way – Rajah Road – Warrambool Road – Orana Road
Evacuation Route Closure	• **Route 1:** Wilfred St may be cut from 1.9m and is accessible to 4WDs only from 2.5m-3.0m, with cars unable to proceed due to water height over Wilfred Road. Orana Road can become inundated between Kiah Close and Narooma Drive at 3.53m during a 20% AEP event requiring reconnaissance and alternate use of Route 2. • **Route 2:** Wilfred St may be cut from 1.9m and is accessible to 4WDs only from 2.5m - 3.0m. • **Route 3:** Wilfred St may be cut from 1.9m and is accessible to 4WDs only from 2.5m – 3.0m.
Method of Evacuation	• Primarily self-evacuation by private transport to higher ground • Primarily self-evacuation by private transport to evacuation centres/assembly areas in Ocean Shores.
Evacuation Centre/Assembly Point	• Ocean Shores Country Club, Orana Rd, Ocean Shores
Large scale evacuations	• When large-scale evacuations are likely, the NSW SES Incident Controller will liaise with the LEOCON and request support of the EOC as required. Large scale evacuations would be unlikely in this sector but if required additional locations will be identified. • Additional locations may be identified in large scale evacuations, or if existing evacuation centres are flood affected or isolated. • Assembly areas may be utilised on higher ground.
Rescue	• The flood rescue management process adopted will be determined by the Incident Controller, based on the scale of the flood rescue operations. • The Incident Controller may declare a flood rescue area of operations and establish a flood cell to assist with the management of flood rescues. • Flood Rescue Operations will be undertaken as per the State Rescue Policy. • Access via High Clearance Vehicle may be possible.
Resupply	• Resupply is unlikely to be required in this sector until floods exceed the Major level, for isolated rural properties outside the flood extent along The Pocket and Middle Pocket roads. • If resupply is required, this would require aerial resupply as access routes will be cut off early.
	• There may be up to 69 properties at risk of isolation in The Pocket. Whilst there is Rising Road Access to Main Arm, this area may also be isolated if Mullumbimby is flooded, and Main Arm Road is cut preventing access to Mullumbimby. These properties are outside of the modelled flood extents. Supply by air may be required if Main Arm Road is cut.

	• There may be up to 45 properties at risk of isolation in Middle Pocket. These properties are outside of the modelled flood extents. Supply by air may be required. • There may be up to 20 properties at risk of isolation in Billinudgel in the vicinity of Moffatts Road and O'Donnells Lane. These properties are outside of the modelled flood extents. Supply by air may be required.
	Table 19, in Volume 2 provides information about isolated communities in the Byron Shire area and potential periods of isolation.
Aircraft Management	***Helicopter Landing Points:*** Suitable landing points are located at: • There are no known validated landing points in this sector.
	Airports: • There are no airports within this sector. The nearest airport is located in the Ballina Shire LGA.
Other	Special considerations relating to evacuation: • Closure of schools - coordinated through the Department of Education and Training. • The evacuation of domestic animals, horses and livestock to the appropriate facility to be managed by Department of Primary Industries and Local Land Services. • Closure of licensed premises. All hotels and licensed clubs will be closed if required. • Security. Police patrols to be established to maintain law and order after evacuation has occurred. • The NSW SES will use flood boats, aircraft, community contacts and other agencies to monitor the safety of individuals, where feasible • These arrangements will stay in place until the "Return with Caution" is provided by the NSW SES to residents to return to their premises.

3.2. BILLINUDGEL SECTOR/COMMUNITY MAP



3.3. EVACUATION PLANNING



Polygon ID	Polygon Name	Gauge Name	Gauge Number	Gauge Height	Comment	Population Estimate	Dwelling Estimate	Vehicle Estimate	Warning Time	Evacuation Time
180	Billinudgel	Billinudgel	202400	1.9	Rising Road Access	13	5	9	1.01	3.02
60637	Marshalls Creek A	Billinudgel	202400	1.9	Rising Road Access	8	3	5	1.01	3.01
60638	The Pocket Road East	Billinudgel	202400	1.9	Overland Escape Route	25	10	18	1.03	3.03
62827	Yelgun Road	mAHD		4.7	Low Flood Island	20	8	14	1.02	3.02
73583	Yelgun South	mAHD		4.7	High Trapped Perimeter	35	14	25	1.04	3.04
64889	Middle Pocket Road	Billinudgel	202400	1.9	Overland Escape Route	31	12	22	1.04	3.04
64890	The Pocket Road West	Billinudgel	202400	1.9	Overland Escape Route	55	21	38	1.06	3.06

4. MULLUMBIMBY SECTOR / COMMUNITY

4.1. MULLUMBIMBY RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Byron Shire for more information about this Sector/Community.

Sector Description	• The Mullumbimby Sector borders Bangalow Sector to the south, the Billinudgel and Greater Ocean Shores Sectors to the northeast and the Tweed Shire to the north and west. • Mullumbimby has a population of approximately 3,859 people living in 1353 dwellings. • Brunswick Heads has a population of 1686 people living in 719 dwellings.		
Hazard	• Riverine flooding from the Brunswick River, Mullumbimby Creek and Saltwater Creek.		
Flood Affect Classification	• Mullumbimby is primarily Low Flood Island with Rising Road Access and Overland Escape Routes. There is a High Flood Island in northeast Mullumbimby. • Brunswick Heads is a High Flood Island up until a 1% AEP event but becomes a Low Flood Island in a PMF event.		
At risk properties	Mullumbimby: 1178 Brunswick Heads: 401	**Total number of properties within Sector/Community**	3780
Sector Control	The Incident Controller will nominate a Sector Commander to control evacuations in this Sector. The NSW SES will conduct evacuations in this sector with assistance from NSW Police, Fire and Rescue NSW, and NSW Rural Fire Service (RFS) volunteers.		

Key Warning Gauge Name	**Name**	**AWRC No.**	**Min (m)**	**Mod (m)**	**Maj (m)**
	• Mullumbimby (Federation Bridge)	202402	2.5	3.5	4.5
	Byron Shire Council Gauges				
	• Durrumbul (558007)	202001	-	-	-
	• Mullumbimby Creek at Azalea St Bridge (558111)	-	-	-	-

General Strategy	• Evacuation of at-risk population. • Self-evacuation to friends/family outside of the impact area. • Establishment of an Assembly Area/Evacuation Centre at **Mullumbimby Ex-Services Club or Mullumbimby St John's Primary School** where evacuees are able to gather while the flood situation is monitored.
Key Risks / Consequences	• Closure of evacuation routes. • Inundation of a large number of dwellings. • Potential of isolation for supplies to hundreds of people in a large flood event for a number of days.
Information and Warnings	• Flood Watch (BoM) • Flood Warnings (BoM) • AWS Advice • AWS Watch and Act

	• AWS Emergency Warning • Sequenced door knocking of evacuation sector • Media announcements (including social media) • Emergency Alerts (SMS, landlines) • Standard Emergency Warning Signal
	• Door knocking may be conducted at a moderate level along with the above methods.
	• Upper Main Arm has an informal telephone tree in place.
Property Protection	***Specific property protection measures:*** • Monitoring rising flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods. • Control of surface water through sandbagging measures. • Monitoring integrity of dwellings surrounded by flood waters.
	Assistance with property protection: • Refer to Chapter 4: Caravan Park Arrangements
	Protection of essential infrastructure: • Brunswick Valley Sewage Treatment Plant on Vallances Road is outside of the modelled 1% AEP flood extent but may be vulnerable during a PMF event. • In larger events, power and water may be compromised but capacity to protect this infrastructure is limited.
Evacuation and/or Isolation Triggers	Evacuation or warning messaging may be considered due to: • Closure of main evacuation routes prior to Inundation • Property inundation
Evacuation Triggers	All effects listed below associated with gauge heights will need to be monitored and verified via reconnaissance wherever possible and should not be considered as absolute. Different sources of flooding within the Mullumbimby Sector may affect consequences. **There are two gauges utilised for warning purposes in this Sector. Predictions for these gauges are as follows.** **Evacuation or warnings for Mullumbimby utilising the Mullumbimby Gauge will be considered when:** • **1). Prediction to reach and/ or exceed 2.5m at Mullumbimby Gauge:** Main Arm Road above the Palmwoods Road junction may become cut, isolating Upper Main Arm (Subsector Main Arm Road). • **2.) Prediction to reach and/ or exceed 3.5m at Mullumbimby Gauge**: Inundation may cut Wilsons Creek Road, isolating several multiple occupancy buildings (Subsector Wilsons Creek A). There is an Overland Escape Route to higher ground. • Water will also enter Fern St and Jubilee Road making them impassable to all vehicles and cutting the evacuation route (Subsector Mullumbimby G). • Main Arm Road may also become cut at this height, preventing evacuation (Subsector Mullumbimby A).

	• **3). Prediction to reach and/ or exceed 4m at Mullumbimby Gauge**: Saltwater Creek may back up and cause water to enter Jubilee Avenue and Myocum Street near the top end of the Golf Course compromising the evacuation route (Subsector Mullumbimby South). • The area south of the Mullumbimby Golf Course may also be cut off from Mullumbimby but has Rising Road Access towards Federal and Bangalow (Subsector Myocum A). • **4). Prediction to reach and/ or exceed 4.07m at Mullumbimby Gauge:** The following roads may become inundated compromising evacuation routes; Main Arm Road, Coral Avenue and Coolamon Scenic Drive (Subsectors Mullumbimby West, Mullumbimby I, Mullumbimby B and Mullumbimby F). • Durrumbul (Subsector Main Arm A) and Main Arm (Subsector Main Arm) may be isolated at this height. The closure of Main Arm Road can also be confirmed by a reading of 15.7m at Durrumbul Gauge. **Evacuation or warnings for Mullumbimby utilising the Azalea St Bridge Gauge will be considered when:** • **1). Prediction to reach and/ or exceed 3.5m at Azalea St Bridge Gauge**: 30cm of water over Left Bank Rd at onset of flooding may cause potential isolation (Subsectors Mullumbimby H and Mullumbimby Creek A) • **2). Prediction to reach and/ or exceed 4m at Azalea St Gauge:** Jubilee Avenue may become compromised with up to 15cm of water over the road, compromising the evacuation route (Subsector South Mullumbimby A). **Evacuation or warning for Brunswick Heads will be considered when:** • **1.) Prediction to reach and/ or exceed 3.2m at Mullumbimby Gauge**: Pacific Motorway roundabout at Riverside Crescent in Brunswick Heads may become inundated before flooding occurs. Water may start to enter Riverside Crescent (Subsector Riverside Crescent) in Brunswick Heads at 3.5m and flood homes above floor level at 4.5m. • **2). Prediction to reach and/ or exceed 4.5m at Mullumbimby Gauge:** Riverside Holiday Park in Brunswick Heads becomes flooded, and water may enter the yards of homes at the western end of Fingal Street in Brunswick Heads (Subsectors Brunswick Heads and Brunswick Heads East). • The Evacuation Centre at Brunswick Civic Memorial Hall is predicted to be flood free during a 1% AEP event, but all of Brunswick Heads is predicted to be inundated during a PMF event. • If a PMF event at approximately 7m is predicted the Incident Controller will need to select the best available alternative Evacuation Centre, before 3.7m is reached at the Billinudgel Gauge potentially cutting the Bayside Brunswick Evacuation Route
Sequencing of evacuation	• Evacuation of vulnerable facilities such as schools, and child-care facilities will require a higher priority. **Mullumbimby Sequencing utilising Mullumbimby Gauge** • **For Prediction 1**: Watch and Act prepare to isolate messaging for Subsector Main Arm Road (GEMS ID 65618) if heights are expected to reach or exceed 2.5m at the Mullumbimby Gauge. • **For Prediction 2**: Watch and Act prepare to isolate messaging for Wilsons Creek A Subsector (GEMS ID 41641) if heights are predicted to exceed 3.5m at the Mullumbimby Gauge.

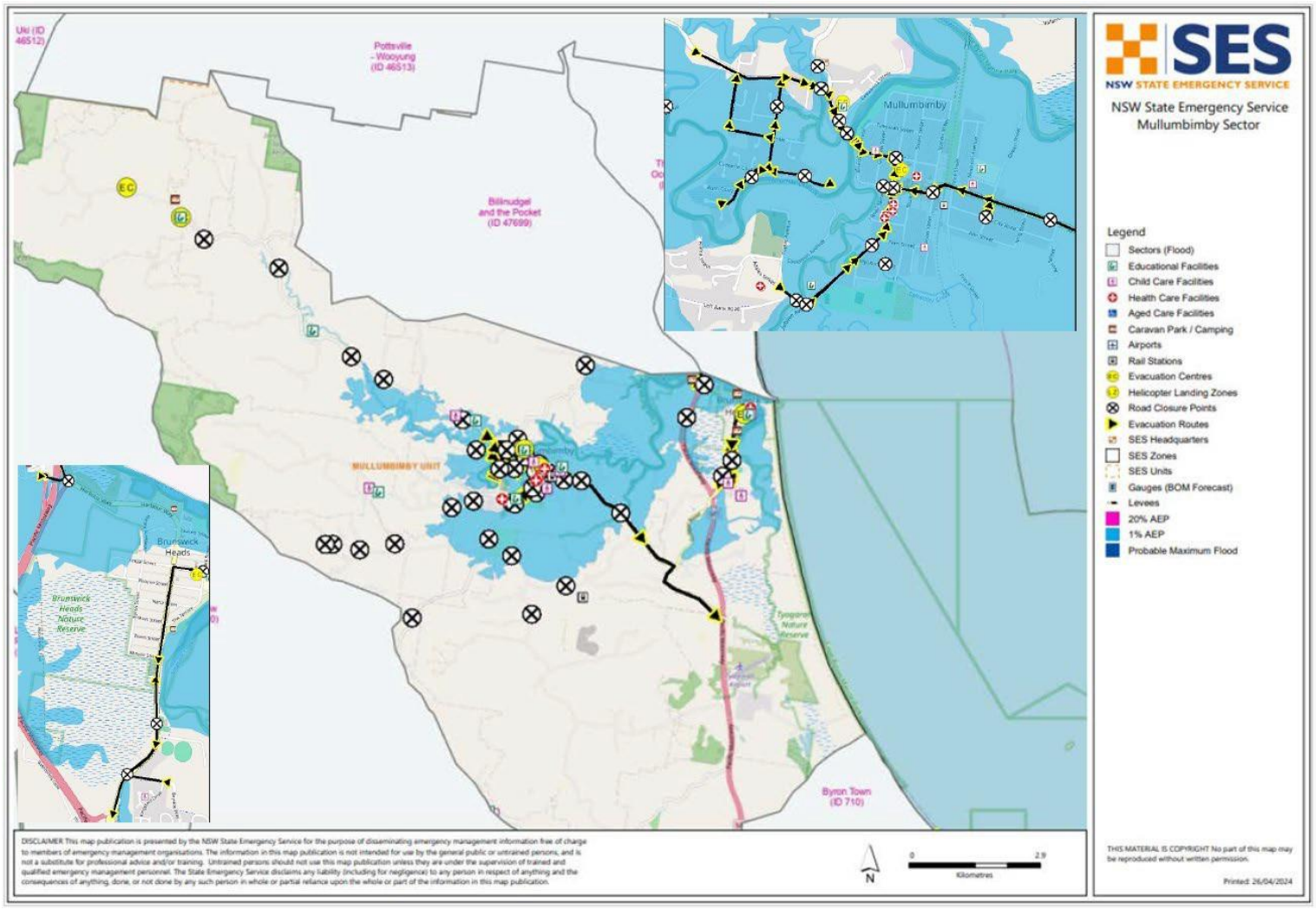
	• Emergency Warning evacuation messaging for Subsectors Mullumbimby G (GEMS ID 41167) and Mullumbimby A (GEMS ID 41161) if heights are predicted to reach or exceed 3.5m at the Mullumbimby Gauge cutting evacuation routes. • **For Prediction 3**: Watch and Act messaging for Subsector Mullumbimby South (GEMS ID 46430) if heights are expected to reach 4m and Emergency Warning evacuation messaging if heights are predicted to exceed 4m at the Mullumbimby Gauge. • **For Prediction 4:** Watch and Act messaging for the Subsectors Mullumbimby West (GEMS ID 46432), Mullumbimby I (GEMS ID 41181), Mullumbimby B (GEMS ID 41162) and Mullumbimby F (GEMS ID 41166) if heights are expected to reach 4.07m and Emergency Warning evacuation messaging if heights are expected to exceed 4.07m at the Mullumbimby Gauge. • Watch and Act prepare to isolate and do not enter flood water messaging for Subsectors Main Arm (GEMS ID 79890) and Main Arm A (GEMS ID 41187) if heights are expected to reach 4.07m at the Mullumbimby Gauge. **Mullumbimby Sequencing utilising Azalea St Bridge Gauge** • **For Prediction 1**: Watch and Act prepare to isolate messaging for the Subsectors Mullumbimby H (GEMS ID 41168) and Mullumbimby Creek A (GEMS ID 41188) if heights expected to exceed 3.5m at the Azalea Street Gauge. • **For Prediction 2:** Watch and Act messaging for Subsector South Mullumbimby A (GEMS ID 41624) if heights are expected to reach 4m and Emergency Warning evacuation messaging if heights are expected to exceed 4m at the Azalea Street Gauge. **Brunswick Heads Sequencing** • **For Prediction 1**: Watch and Act prepare to isolate messaging for Subsector Riverside Crescent (GEMS ID 65347) if heights are expected to reach but not exceed 3.2m and Emergency Warning evacuation messaging if heights are expected to exceed 3.2m at the Mullumbimby Gauge. • **For Prediction 2:** Watch and Act messaging for Subsectors Brunswick Heads (GEMS ID 65622) and Brunswick Heads East (GEMS ID 65621 if heights are expected to reach 4.5m, and Emergency Warning evacuation messaging for Riverside Holiday Park and homes at western end of Fingal Street if heights are expected to exceed 4.5m at the Mullumbimby Gauge. • Note that there is the potential for road closures between Bayside Way and the Pacific Motorway roundabout at 3.7m which would need to be monitored during an event.
Evacuation Routes	**Mullumbimby** • **Mullumbimby Evacuation Route West:** Local roads - Main Arm Road – Murwillumbah Road - Mullumbimby St John's Primary School. • **Riverside Drive Evacuation Route:** Riverside Drive – Pine Avenue – Main Arm Road - Mullumbimby St John's Primary School. • **Mullumbimby Evacuation Route South:** Azalea Street – Jubilee Avenue – Dalley Street - Mullumbimby Ex-Services Club • **Mullumbimby Evacuation Route East:** Queen Street – Argyle Street – Station Street- Burringbar Street – Dalley Street - Mullumbimby Ex-Services Club **Brunswick Heads**

	• **Riverside Crescent Evacuation Route**: Riverside Crescent - Brunswick Valley Way - Rajah Road - Warrambool Road - Orana Road - Ocean Shores Country Club • **Brunswick Heads Evacuation Route**: Local roads to Brunswick Civic Memorial Hall on Fingal Street • **Bayside Brunswick Evacuation Route**: Bayside Way – Tweed Street – Fingal Street – Brunswick Civic Memorial Hall
Evacuation Route Closure	**Mullumbimby** • **Mullumbimby Evacuation Route West:** The first causeway on Main Arm Road may be cut at 5.6m at the Mullumbimby Gauge. • **Riverside Drive Evacuation Route:** Riverside Drive may be cut at 4.3m at the Mullumbimby Gauge. Pine Avenue south of Hibiscus Place may be cut at 5.4m at the Mullumbimby Gauge. The first causeway on Main Arm Road may be cut at 5.6m at the Mullumbimby Gauge. • **Mullumbimby Evacuation Route South:** Jubilee Avenue may close at 4.21m north of Azalea Street intersection and at 4.71m south of Fern Street at the Mullumbimby Gauge. Dalley Street at the intersection of Burringbar Street may be cut 5.01m at the Mullumbimby Gauge • **Mullumbimby Evacuation Route East:** Argyle Street west of James Street may be cut at 4.6m at the Mullumbimby Gauge. Queen Street at the intersection of New City Road may be cut at 2.6m the Mullumbimby Gauge. Burringbar Street at the intersection of Station Street may be cut at 5.25m at the Mullumbimby Gauge. Dalley Street at the intersection of Burringbar Street may be cut 5.01m at the Mullumbimby Gauge. Note that egress to the Pacific Motorway along Mullumbimby Road and Gulgan Road may be cut early by flash flooding, with the bridge over Kings Creek possibly cut at its road level of 2.58m AHD. **Brunswick Heads** • **Riverside Crescent Evacuation Route:** Harbour Way roundabout may close at 3.21m • **Brunswick Heads Evacuation Route**: Fingal Street at the intersection of Park Street may close at 5.23m at the Mullumbimby Gauge. • **Bayside Brunswick Evacuation Route:** The intersection of Bayside Way and Tweed Street may be cut at 3.7m at Mullumbimby Gauge.
Method of Evacuation	• Primarily self-evacuation by private transport to higher ground • Primarily self-evacuation by private transport to evacuation centres/assembly areas
Evacuation Centre/Assembly Point	• Mullumbimby St John's Primary School. Outside of modelled PMF extent. • Mullumbimby Ex Services Club. Within 1% AEP flood extent. • Brunswick Civic Memorial Hall. Outside of 1% AEP flood extent but within PMF extent. • Kohinur Hall. • Upper Main Arm Public School • Wilsons Creek Community Hall • Wilsons Creek Public School
Large scale evacuations	• When large-scale evacuations are likely, the NSW SES Incident Commander will liaise with the LEOCON and request support of the EOC as required. Large scale evacuations would be unlikely in this sector but if required additional locations will be identified. • Additional locations may be identified in large scale evacuations, or if existing evacuation centres are flood affected or isolated.

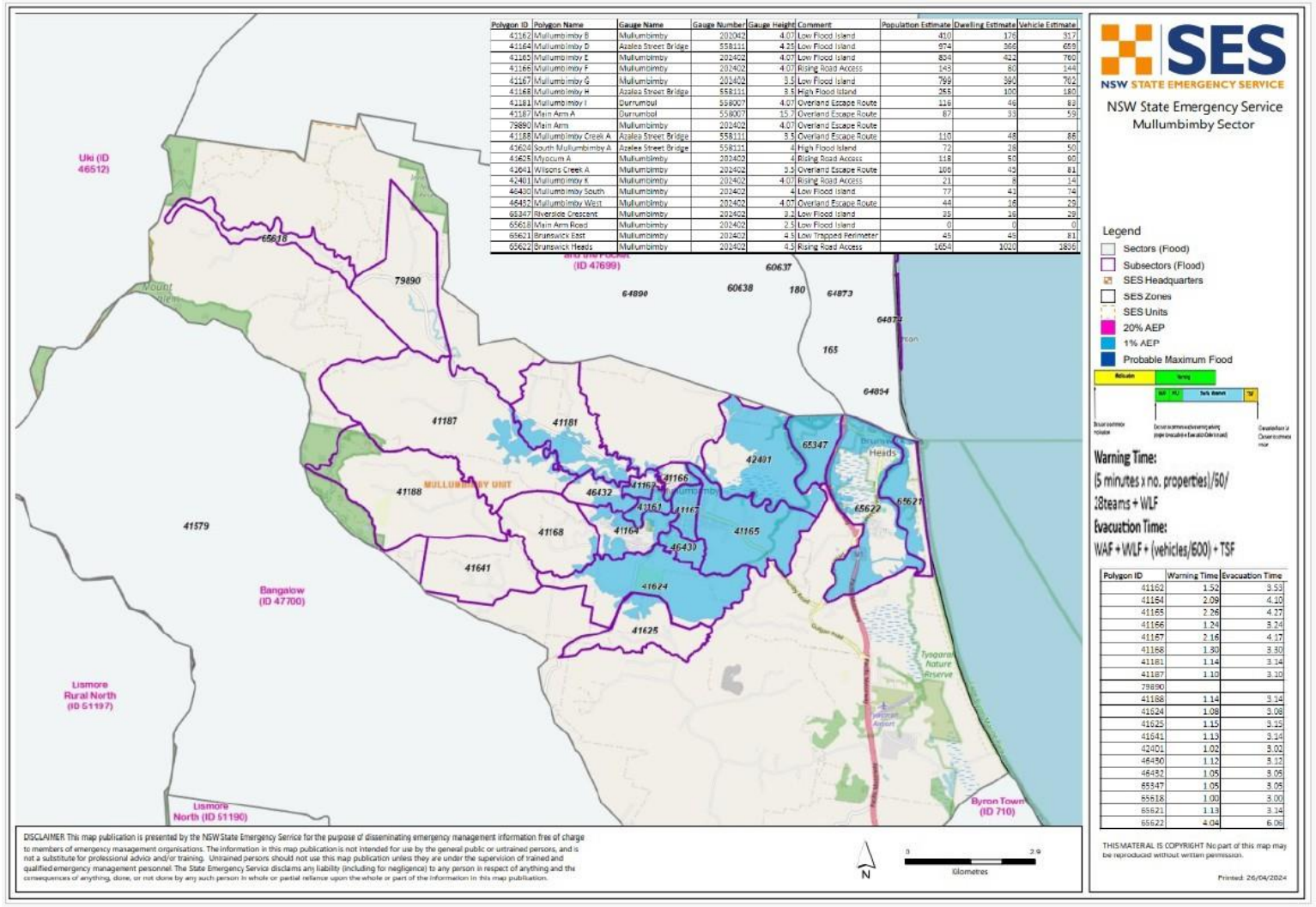
	• Assembly areas may be utilised on higher ground
Rescue	• The flood rescue management process adopted will be determined by the Incident Controller, based on the scale of the flood rescue operations. • The Incident Controller may declare a flood rescue area of operations and establish a flood cell to assist with the management of flood rescues. • Flood Rescue Operations will be undertaken as per the State Rescue Policy • Rescue hotspots include Avocado Court, Grevillea Avenue, Pine Avenue, New City Road and Morrison Avenue.
	• Access to Main Arm, Mullumbimby Creek and Wilsons Creek may be possible via High Clearance Vehicle.
Resupply	• Resupply is unlikely to be required in this sector until floods exceed the Moderate Flood level. • If resupply is required, it will be provided by the NSW SES through the 132500 call out system.
	• Main Arm could become isolated for 2-3 days, with up to 230 homes requiring resupply by air. • In the Upper Main Arm area beyond Palmwoods T-intersection there could be upwards of 25 homes isolated for 2-3 days requiring resupply during normal flooding in the Main Arm of the Brunswick River, but this number could dramatically increase during a protracted flood period. • Durrumbul may have approximately 88 dwellings isolated for 2-3 days requiring resupply by air.
	Table 19, in Volume 2 provides information about isolated communities in the Byron Shire area and potential periods of isolation.
Aircraft Management	***Helicopter Landing Points:*** There are no designated landing points in the Mullumbimby Sector.
	Airports: There are no airports within this sector. The nearest airport is located in the Ballina Shire LGA.
Other	• There are a significant number of people living off the grid in multiple occupancy dwellings in the hinterland above Mullumbimby. Accurate statistics for the number of people and dwellings are not held and it is likely that telecommunications may be limited. • Closure of schools - coordinated through the Department of Education and Training. • The evacuation of domestic animals, horses and livestock to the appropriate facility to be managed by Department of Primary Industries and Local Land Services. • Closure of licensed premises. All hotels and licensed clubs will be closed if required.

	• Security. Police patrols to be established to maintain law and order after evacuation has occurred. • The NSW SES will use flood boats, aircraft, community contacts and other agencies to monitor the safety of individuals, where feasible. • These arrangements will stay in place until the “Return with Caution” is provided by the NSW SES to residents to return to their premises.

4.2. MULLUMBIMBY SECTOR/COMMUNITY MAP



4.3. EVACUATION PLANNING



Polygon ID	Polygon Name	Gauge Name	Gauge Number	Gauge Height	Comment	Population Estimate	Dwelling Estimate	Vehicle Estimate
41162	Mullumbimby B	Mullumbimby	202042	4.07	Low Flood Island	410	176	317
41164	Mullumbimby D	Azalea Street Bridge	558111	4.25	Low Flood Island	974	366	659
41165	Mullumbimby E	Mullumbimby	202402	4.07	Low Flood Island	894	422	760
41166	Mullumbimby F	Mullumbimby	202402	4.07	Rising Road Access	143	80	144
41167	Mullumbimby G	Mullumbimby	202402	3.5	Low Flood Island	799	390	702
41168	Mullumbimby H	Azalea Street Bridge	558111	3.5	High Flood Island	255	100	180
41181	Mullumbimby I	Durrumbul	558007	4.07	Overland Escape Route	116	46	82
41187	Main Arm A	Durrumbul	558007	15.7	Overland Escape Route	87	33	59
79890	Main Arm	Mullumbimby	202402	4.07	Overland Escape Route			
41188	Mullumbimby Creek A	Azalea Street Bridge	558111	3.5	Overland Escape Route	110	48	86
41624	South Mullumbimby A	Azalea Street Bridge	558111	4	High Flood Island	72	28	50
41625	Myocum A	Mullumbimby	202402	4	Rising Road Access	118	50	90
42641	Wilsons Creek A	Mullumbimby	202402	2.5	Overland Escape Route	109	45	81
42401	Mullumbimby K	Mullumbimby	202402	4.07	Rising Road Access	21	8	14
46430	Mullumbimby South	Mullumbimby	202402	4	Low Flood Island	77	41	74
46432	Mullumbimby West	Mullumbimby	202402	4.07	Overland Escape Route	44	18	29
65347	Riverside Crescent	Mullumbimby	202402	3.2	Low Flood Island	35	19	29
65618	Main Arm Road	Mullumbimby	202402	2.5	Low Flood Island	0	0	0
65621	Brunswick East	Mullumbimby	202402	4.5	Low Trapped Perimeter	45	48	81
65622	Brunswick Heads	Mullumbimby	202402	4.3	Rising Road Access	1654	1020	1836

Polygon ID	Warning Time	Evacuation Time
41162	1.52	3.53
41164	2.09	4.10
41165	2.26	4.27
41166	1.24	3.24
41167	2.16	4.17
41168	1.30	3.30
41181	1.14	3.14
41187	1.10	3.10
79890		
41188	1.14	3.14
41624	1.08	3.08
41625	1.15	3.15
41641	1.13	3.14
42401	1.02	3.02
46430	1.12	3.12
46432	1.05	3.05
65347	1.05	3.05
65618	1.00	3.00
65621	1.13	3.14
65622	4.04	6.06

5. GREATER OCEAN SHORES SECTOR/ COMMUNITY

5.1. GREATER OCEAN SHORES RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Byron Shire for more information about this Sector/Community.

<table>
<tr><td>Sector Description</td><td colspan="5">The Greater Ocean Shores encompasses Ocean Shores, South Golden Beach and New Brighton
Ocean Shores has a population of 4818 people living in 1855 dwellings
South Golden Beach has a population of 2219 people living in 799 dwellings
New Brighton has a population of 368 living in 130 dwellings</td></tr>
<tr><td>Hazard</td><td colspan="5">Riverine and Overland flooding</td></tr>
<tr><td>Flood Affect Classification</td><td colspan="5">Ocean Shores North and South have Rising Road Access
South Golden Beach is Low Flood Island
New Brighton is a Low Trapped Perimeter</td></tr>
<tr><td>At risk properties</td><td>Ocean Shores: 614
South Golden Beach: 352
New Brighton: 192</td><td colspan="2">Total number of properties within Sector/Community</td><td colspan="2">3313</td></tr>
<tr><td>Sector Control</td><td colspan="5">The Incident Controller will nominate a Sector Commander to control evacuations in this Sector. The NSW SES will conduct evacuations in this sector with assistance from NSW Police, Fire and Rescue NSW, and NSW Rural Fire Service (RFS) volunteers.</td></tr>
<tr><td>Key Warning Gauge Name</td><td colspan="5"><table><tr><th>Name</th><th>AWRC No.</th><th>Min (m)</th><th>Mod (m)</th><th>Maj (m)</th></tr><tr><td>Billinudgel Gauge</td><td>202400</td><td>2.5</td><td>3.0</td><td>3.5</td></tr></table></td></tr>
<tr><td>General Strategy</td><td colspan="5">Evacuation of at-risk population.
Self-evacuation to friends/family outside of the impact area.
Establishment of an Assembly Area/Evacuation Centre at Ocean Shores Country Club, Ocean Shores Seventh Day Adventist Church where evacuees are able to gather while flood situation is monitored.</td></tr>
<tr><td>Key Risks / Consequences</td><td colspan="5">Closure of evacuation routes
Inundation of a large number of dwellings.
Isolation of a large number of people for a number of days
The South Golden Beach levee has an overtopping height of 3.5m AHD designed to provide protection up to a 1% AEP event at this location.</td></tr>
<tr><td>Information and Warnings</td><td colspan="5">Flood Watch (BoM)
Flood Warnings (BoM)
AWS Advice
AWS Watch and Act
AWS Emergency Warning
Sequenced door knocking of evacuation sector
Media announcements (including social media)</td></tr>
</table>

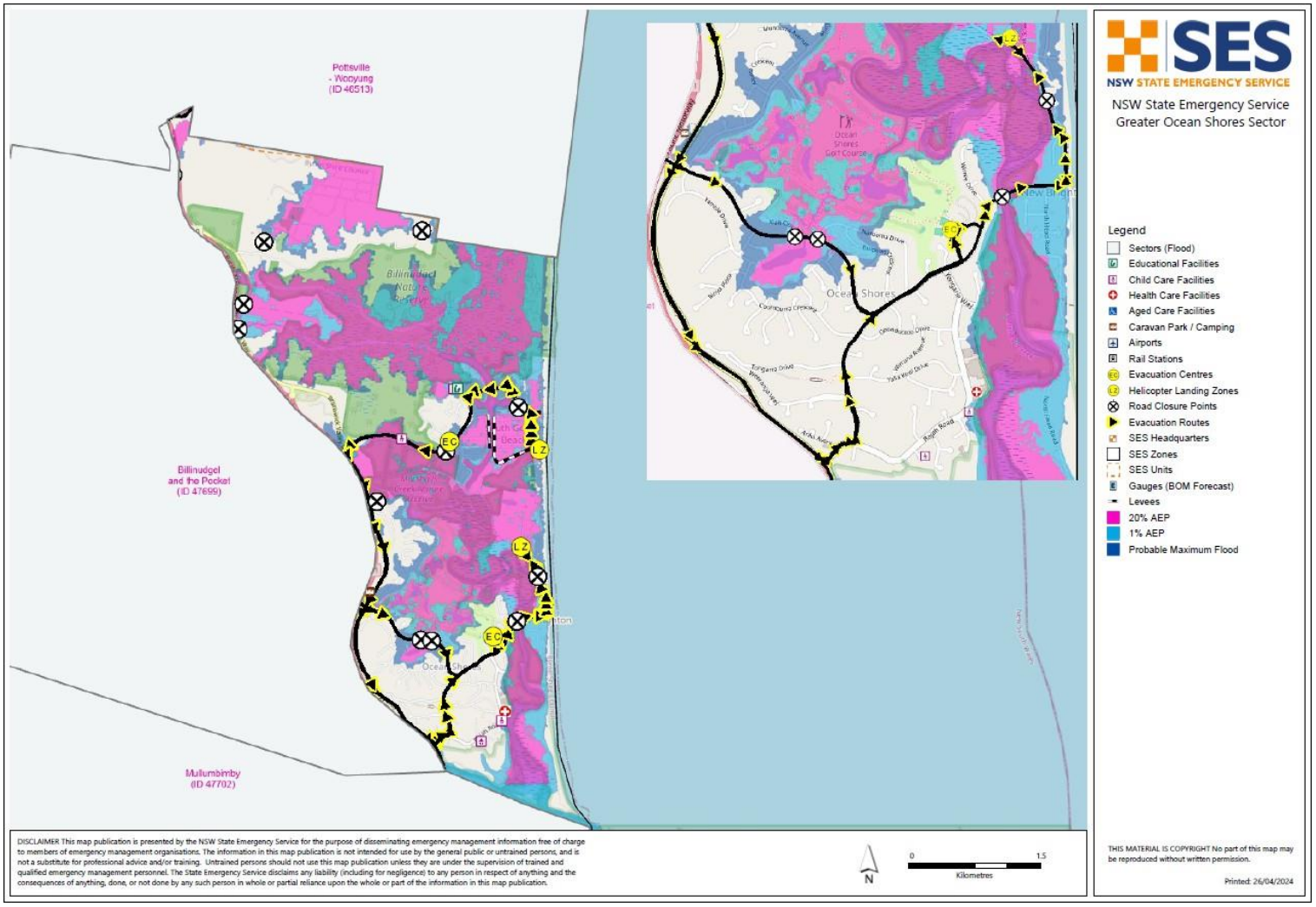
	• Emergency Alerts (SMS, landlines) • Standard Emergency Warning Signal
Property Protection	***Specific property protection measures:*** • Monitoring rising flood waters. • Control of surface water through sandbagging measures. • Monitoring integrity of dwellings surrounded by flood waters.
	Assistance with property protection: • Refer to Chapter 4: Caravan Park Arrangements
	Protection of essential infrastructure: • Oceans Shores Sewage Treatment Plant, located at 21 Smokey Valley Way is within the 5% AEP flood extent.
Evacuation and/or Isolation Triggers	Evacuation may be considered for floods that are expected to cause; • Closure of main evacuation routes prior to Inundation • Property inundation • Failure of essential services
Evacuation Triggers	All effects listed below associated with gauge heights will need to be monitored and verified via reconnaissance wherever possible and should not be considered as absolute. Different sources of flooding within the Greater Ocean Shores Sector may affect consequences. **Evacuation or warnings will be considered when:** • **1.) Prediction to reach and/or exceed 2.5m at Billinudgel Gauge:** The evacuation route to Ocean Shores Country club along Shara Boulevard is cut, causing the area to become isolated, however over floor inundation is not expected to commence until 4.5m (Subsector South Golden Beach A). The South Golden Beach levee has an overtopping height of 3.5m AHD designed to provide protection up to a 1% AEP event at this location, equivalent to approximately 3.2m at the Billinudgel Gauge. • The area west of Shara Boulevard in northern Ocean Shores may become isolated at this point, however it is outside the PMF extent and has a secondary evacuation centre (Subsector Ocean Shores North A). • The Marshalls Creek Nature Reserve and Ocean Shores Golf Course may be inundated at this height (Subsector Ocean Shore North B). • **2.) Prediction to reach and or exceed 3.5m at Billinudgel Gauge:** New Brighton will begin to have above floor inundation at this height in the vicinity of Pacific Street and Riversea Lane. The evacuation route on River Street in New Brighton (Subsector New Brighton) may start overtopping at 3.5m, however depending on the timing and duration of the flood may be cut earlier. The southern part of New Brighton may see above floor inundation from 3.72m requiring evacuation before evacuation route compromised the evacuation route may compromised on Strand Avenue over the Orana Bridge. • Orana Rd near Kiah Close in Ocean Shores *may* start to be flooded preventing access to the evacuation centre at Ocean Shores Country Club at 3.55m. This may occur approximately 34 hours after the Minor flood level is exceeded at the Billinudgel Gauge. Properties in the vicinity of Orana Road and Kiah Close may begin to experience above floor inundation at this height, with increasing inundation beyond this height. Orana Road near Narooma Drive to the east may also be cut at 3.92m (Subsector Ocean Shores South).

	• The area north-northwest of Ocean Shores may experience some inundation at this height during a 20% AEP event, (Subsectors North Byron Parklands, Billinudgel Nature Reserve and Wooyung). These subsectors are largely uninhabited but within modelled flooded extents. *****Note that North Byron Parklands has an internal flood plan and evacuation triggers, and consultation will be required with SES when major entertainment events are held, as SES could potentially have to manage festival attendees in their thousands during a flood event, once they have left the grounds of the North Byron Parklands. • **3.) Prediction to reach and/ or exceed 3.72m at Billinudgel Gauge:** During a 10% AEP event, inundation may occur along the north west parts of Balemo Drive at this height with wider inundation in a 1% AEP event and significant inundation in a PMF event (Subsector Ocean Shore North). • **4.) Prediction to reach and/or exceed 3.92m at Billinudgel Gauge:** The area east of Marshalls Creek and west of Rajah Road may start to become inundated at this height (Subsector Ocean Shores).
Sequencing of evacuation	• Evacuation of vulnerable facilities such as the hospital, aged care facilities, schools, and child-care facilities will require a higher priority. • **For Prediction 1**: Watch and Act messaging if heights are expected to reach 4.5m, for the Subsectors South Golden Beach A (GEMS ID 191) and Ocean Shores North A (GEMS ID 64869). • If heights are predicted to exceed 4.5m, Emergency Warning evacuation messaging for Subsector South Golden Beach A (GEMS ID 191) in order to evacuate to Ocean Shores Country Club before 2.5m is reached and access is compromised. • If the evacuation centre at the Seventh Day Adventist Church in Subsector Ocean Shores North A (GEMS ID 64869) is utilised instead, additional time may be available however road closures along this route need to be monitored. • **For Prediction 2:** Watch and Act messaging for Subsector New Brighton (GEMS ID 64874) if heights are expected to reach 3.5m, and Emergency Warning evacuation messaging if heights are expected to exceed 3.5m, before River St is cut at 3.5m and evacuation route at Orana Bridge is cut at 4.22m. • Watch and Act messaging for Subsector Oceans Shores South (GEMS ID 165) if heights are expected to reach 3.55m and Emergency Warning Evacuation messaging if heights are predicted to exceed 3.55m before access to evacuation routes via Balemo Drive may be cut. • Watch and Act do not enter floodwater messaging for Subsectors North Byron Parklands (GEMS ID 64893), Billinudgel Nature Reserve (GEMS ID 64892) and Wooyung (GEMS ID 64891) if heights are expected to reach 3.55m and Emergency Warning evacuation messaging if heights are expected to reach or exceed 3.55m. • Consultation with North Byron Parklands should be held regarding evacuation of the North Byron Parklands (Subsector North Byron Parklands). • **Prediction 3:** Watch and Act messaging for the Subsector Ocean Shores North (GEMS ID 164) If heights are expected to reach 3.72m, and Emergency Warning evacuation messaging if heights are expected to exceed 3.72m, for properties along Balemo Drive, and evacuation of entire Subsector if a PMF event is predicted at approximately 5.8m

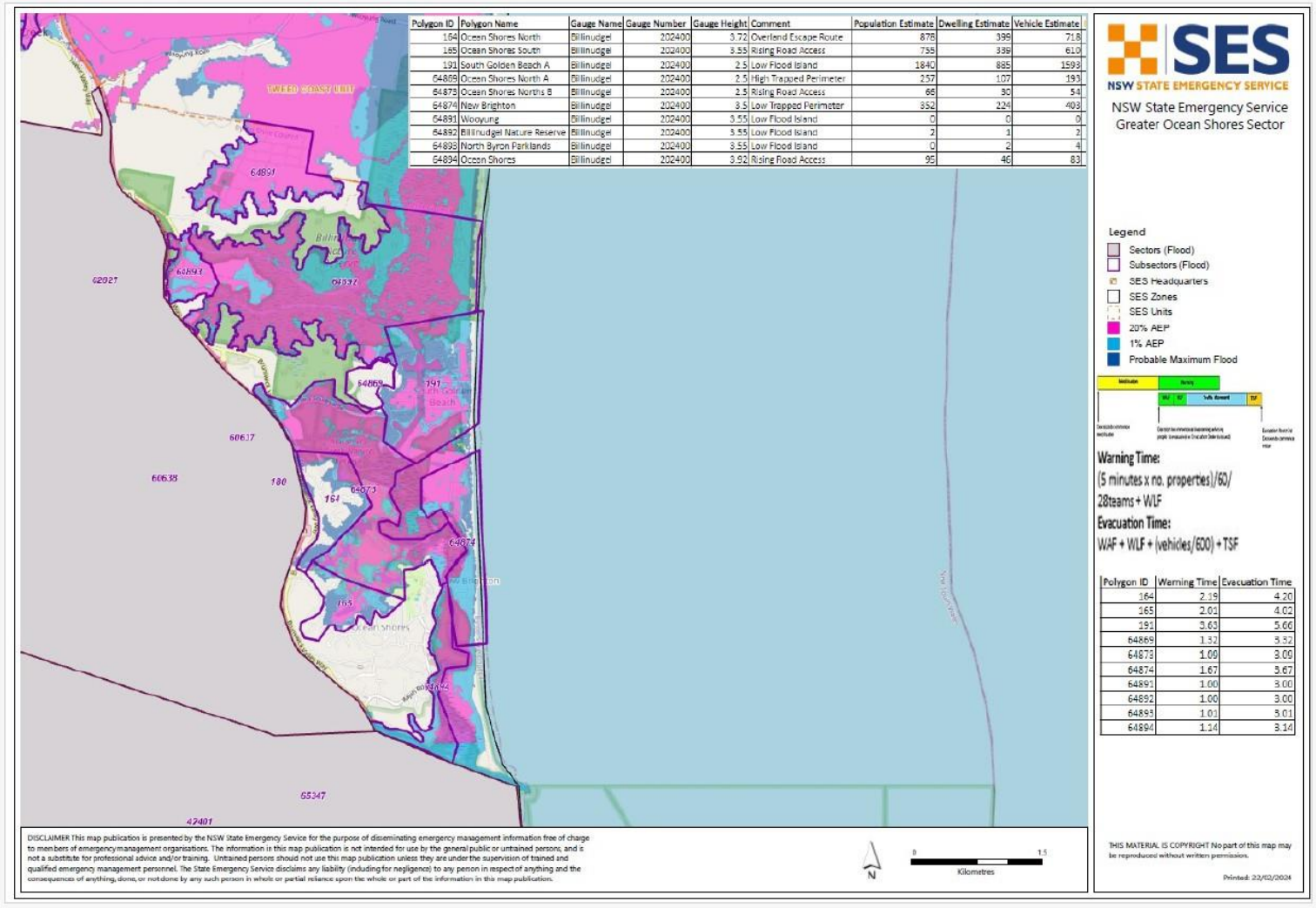
	• **Prediction 4:** Watch and Act messaging for Subsector Ocean Shores (GEMS ID 64894) if heights are expected to reach 3.92m and Emergency Warning evacuation if heights are expected to exceed 3.92m.
Evacuation Routes	• **Route 1 from South Golden**: Beach Avenue – Rangal Road – Kallaroo Circuit – Shara Boulevarde – Ocean Shores Seventh Day Adventist Church (alternate) • **Route 2 from South Golden:** Beach Avenue – Rangal Road – Kallaroo Circuit – Shara Boulevarde – Brunswick Valley Way – Orana Road – Ocean Shores Country Club. At 3.55m Orana Road near Kiah Close in Ocean Shores may become inundated, compromising the primary evacuation route from South Golden and requiring the use of Route 3. • **Route 3 from South Golden:** Beach Avenue – Rangal Road – Kallaroo Circuit – Shara Boulevarde – Brunswick Valley Way – Rajah Road – Warrambool Road – Orana Road - Ocean Shores Country Club • **Route 1 from New Brighton:** River Street -The Esplanade – Strand Avenue – Orana Road – Ocean Shores Country Club
Evacuation Route Closure	• **Route 1 from South Golden**: Shara Boulevard south of Bass Court intersection may be cut at 2.5m, at Billinudgel Gauge and Rangal Road at intersection with Berimbillah Court may be cut at 4.22m at Billinudgel Gauge. • **Route 2 from South Golden:** Orana Road, between Kiah Close and Narooma Drive, may be cut at 3.5m AHD at Billinudgel Gauge followed by Orana Road near Narooma Drive at 3.92m • **Route 1 from New Brighton:** River Street north of Pacific Street intersection may be cut at 3.62m at Billinudgel Gauge, and the Orana Road Bridge at 4.22m at Billinudgel Gauge.
Method of Evacuation	• Primarily self-evacuation by private transport to higher ground • Primarily self-evacuation by private transport to evacuation centres/assembly areas
Evacuation Centre/Assembly Point	• Ocean Shores Country Club • Ocean Shores Seventh Day Adventist Church
Large scale evacuations	• When large-scale evacuations are likely, the NSW SES Incident Commander will liaise with the LEOCON and request support of the EOC as required. Large scale evacuations would be unlikely in this sector but if required additional locations will be identified. • Additional locations may be identified in large scale evacuations, or if existing evacuation centres are flood affected or isolated. • Assembly areas may be utilised on higher ground
Rescue	• The flood rescue management process adopted will be determined by the Incident Controller, based on the scale of the flood rescue operations. • The Incident Controller may declare a flood rescue area of operations and establish a flood cell to assist with the management of flood rescues. • Flood Rescue Operations will be undertaken as per the State Rescue Policy
	• The South Golden Beach levee has an overtopping height of 3.5m AHD designed to provide protection up to a 1% AEP event at this location, equivalent to 3.2m AHD. Evacuation is recommended before evacuation routes from South Golden Beach are closed at 2.5m at the Billinudgel Gauge.
Resupply	• Resupply is unlikely to be required in this sector until floods exceeding the Major level.

	• If resupply is required, it will be provided by the NSW SES through the 132500 call out system.
	Table 19, in Volume 2 provides information about isolated communities in the Byron Shire area and potential periods of isolation.
Aircraft Management	***Helicopter Landing Points:*** Suitable landing points are located at: • Flowers Park 28.508° S 153.5484° E The Flowers Park Helicopter Landing Point may be within the flood extent for a 10% AEP event. • South Golden Beach Community Centre 28.4977° S 153.5507° E The South Golden Beach Community Centre Helicopter Landing Point may be within the flood extent for a 1% AEP event.
	Airports: There are no airports within this sector. The nearest airport is located in the Ballina Shire LGA.
Other	• If festivals are planned or underway at North Byron Parklands when flooding is predicted, coordination should be undertaken between the Incident Controller and North Byron Parklands authorities. • Closure of schools - coordinated through the Department of Education and Training. • The evacuation of domestic animals, horses and livestock to the appropriate facility to be managed by Department of Primary Industries and Local Land Services. • Closure of licensed premises. All hotels and licensed clubs will be closed if required. • Security. Police patrols to be established to maintain law and order after evacuation has occurred. • The NSW SES will use flood boats, aircraft, community contacts and other agencies to monitor the safety of individuals, where feasible. • These arrangements will stay in place until the “Return with Caution” is provided by the NSW SES to residents to return to their premises.

5.2. GREATER OCEAN SHORES SECTOR/COMMUNITY MAP



5.3. EVACUATION PLANNING



Polygon ID	Polygon Name	Gauge Name	Gauge Number	Gauge Height	Comment	Population Estimate	Dwelling Estimate	Vehicle Estimate
164	Ocean Shores North	Billinudgel	202400	3.72	Overland Escape Route	876	399	718
165	Ocean Shores South	Billinudgel	202400	3.55	Rising Road Access	755	359	610
191	South Golden Beach A	Billinudgel	202400	2.5	Low Flood Island	1840	885	1593
64869	Ocean Shores North A	Billinudgel	202400	2.5	High Trapped Perimeter	257	107	193
64873	Ocean Shores North B	Billinudgel	202400	2.5	Rising Road Access	66	30	54
64874	New Brighton	Billinudgel	202400	3.5	Low Trapped Perimeter	352	224	403
64891	Wooyung	Billinudgel	202400	3.55	Low Flood Island	0	0	0
64892	Billinudgel Nature Reserve	Billinudgel	202400	3.55	Low Flood Island	2	1	2
64893	North Byron Parklands	Billinudgel	202400	3.55	Low Flood Island	0	2	4
64894	Ocean Shores	Billinudgel	202400	3.92	Rising Road Access	95	46	83

Polygon ID	Warning Time	Evecuation Time
164	2.19	4.20
165	2.01	4.02
191	3.63	5.66
64869	1.32	3.32
64873	1.09	3.09
64874	1.67	3.67
64891	1.00	3.00
64892	1.00	3.00
64893	1.01	3.01
64894	1.14	3.14

BYRON SHIRE NSW SES
CARAVAN PARK ARRANGEMENTS

Chapter 4 of Volume 3 (NSW SES Response Arrangements for Byron Shire) of the Byron Shire Flood Emergency Sub Plan

Last Update: May 2024

AUTHORISATION

NSW SES Locality Response Arrangements in Byron Shire Council has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Elena Palamara (May 8, 2024 08:50 GMT+10)

NSW SES North Eastern Zone Coordinator Planning (Elena Palamara)

Date: 07/05/2024

Approved

NSW SES North Eastern Zone Acting Deputy Zone Commander (Telesia Loloa)

Date: 07/05/2024

Tabled at LEMC

Date: 08/05/2024

Document Issue: V3.2-07042014

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1 ARRANGEMENTS FOR THE EVACUATION OF CARAVAN PARKS AND THE RELOCATION OF MOVABLE DWELLINGS

1.1 GENERAL

1.1.1 The following caravan parks are flood liable:

a. Broken Head Holiday Park, Broken Head

b. Reflections – Terrace Reserve, Brunswick Heads

c. Reflections – Massey Greene, Brunswick Heads

d. Reflections – Ferry Reserve, Brunswick Heads

e. First Sun Holiday Park, Byron Bay

f. Belongil Fields, Byron Bay

g. Discovery Park, Byron Bay

h. Ingenia Holidays Byron Bay, Byron Bay

i. Reflections Byron Bay, Byron Bay

j. Maca's Camping Ground, Mullumbimby

k. Mullumbimby RLFC and Caravan Park, Mullumbimby

l. Mullumbimby Showground (Campground), Mullumbimby

m. Suffolk Beachfront Holiday Park, Suffolk Park

1.1.2 For more information on individual caravan parks see Table 1 at the end of this Chapter.

1.2 ADVISING PROCEDURES

1.2.1 Caravan Park proprietors will ensure that the owners and occupiers of movable dwellings are:

a. Made aware that the caravan park is flood liable by:

- Providing a written notice to occupiers taking up residence. The notice will indicate that the caravan park is liable to flooding and designate the location of flood liable land within the park (1).
- Displaying this notice and the emergency arrangements for the Caravan Park prominently in the park.

b. Made aware that if they are expecting to be absent for extended periods, they should:

- Provide the manager of the caravan park with a contact address and telephone number in case of an emergency.

- Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e.: should ensure that the wheels, axles and draw bar of the caravans are not removed, and are maintained in proper working order).

c. Informed of Flood Warning Information. At this time, occupiers will be advised by Caravan Park proprietors to:

- Ensure that they have spare batteries for their radios.
- Listen to a local radio station for updated flood information.
- Prepare for evacuation and movable dwelling relocation.

1.2.2 The NSW SES Mullumbimby Unit Commander will ensure that the managers of caravan parks are advised of Flood Information (described in Volume 1 of the Byron Local Flood Plan).

1.3 EVACUATION OF OCCUPANTS AND RELOCATION OF MOVEABLE DWELLINGS

1.3.1 When an evacuation order is given caravan park occupants should follow the flood evacuation procedures for the park under the direction of the caravan park management. This should include advice to:

a. Isolate power to moveable dwellings.

b. Collect personal papers, medicines, a change of clothing, toiletries and bedclothes.

c. Lift the other contents in any remaining dwellings as high as possible.

d. Move to friends, relatives or a designated evacuation centre if they have their own transport, or move to the caravan office to await transport.

e. If undertaking self-managed evacuation, register their movements with the caravan park management upon leaving the park.

1.3.2 Where possible, movable dwellings that can be moved will be relocated by their owners. Park managers will arrange for the relocation of movable dwellings as required. Council and NSW SES personnel may assist if required. Vans are to be moved to the locations outlined in Table 1 at the end of this Chapter.

1.3.3 Caravan park managers will:

a. Secure any movable dwellings that are not able to be relocated to prevent floatation.

b. Ensure that their caravan park is capable of being evacuated in a timely and safe manner.

c. Advise the NSW SES Mullumbimby Unit Commander of:

- The number of people requiring transport.
- Details of any medical evacuations required.

- Whether additional assistance is required to effect the evacuation.

d. Check that all residents and visitors are accounted for.

e. Inform the NSW SES Mullumbimby Unit Commander when the evacuation of the caravan park has been completed.

f. Provide the NSW SES Mullumbimby Unit Commander with a register of people that have been evacuated.

1.4 RETURN OF OCCUPANTS AND MOVEABLE DWELLINGS

1.4.1 The NSW SES Mullumbimby Unit Commander, using council resources as necessary, will advise when it is safe for the caravan parks to be re-occupied.

1.4.2 Moveable dwellings will be returned back to the caravan park(s) by owners or by vehicles and drivers arranged by the park managers.

1.4.3 Council and NSW SES personnel may assist by request where resources are available.

Table 1: Caravan Parks at risk of Inundation and/or Isolation from Flooding.

Name	Address/Location description	Town/Sector	Number of sites	Risk	Evacuation route	Evacuation route closure	Moveable dwelling relocation location	Evacuation centre	Notes
Reflections - Terrace Reserve	Fingal Street, Brunswick Heads	Mullumbimby	143 sites total, including camps sites, permanent residences and 10 cabins	Inundation *may* occur during a 1% AEP event, approximately 5.24m at the Mullumbimby Gauge	The Terrace - Fingal Street	Fingal Street at the intersection of Park Street may close at 5.23m at the Mullumbimby Gauge	No moveable dwellings	Brunswick Civic Memorial Hall, up to 1% AEP event. If a PMF event is predicted, evacuation would need to occur before 3.7m is reached at the Billinudgel Gauge	Low Flood Island. Peak season Dec-Jan, Easter and School Holidays
Reflections - Massey Greene	Tweed Street, Brunswick Heads	Mullumbimby	114 sites total, 86 campsites, 14 cabins, 16 permanent residences	Inundation *may* occur during a 1% AEP event, approximately 5.24m at the Mullumbimby Gauge.	Harbour Way - Tweed Street - Fingal Street	Fingal Street at the intersection of Park Street may close at 5.23m at the Mullumbimby Gauge	NA	Brunswick Civic Memorial Hall, up to 1% AEP event. If a PMF event is predicted, evacuation would need to occur before 3.7m at Billinudgel Gauge	Rising Road Access. Peak season Dec-Jan, Easter and School Holidays

Name	Address/Location description	Town/Sector	Number of sites	Risk	Evacuation route	Evacuation route closure	Moveable dwelling relocation location	Evacuation centre	Notes
Reflections – Ferry Reserve	Riverside Crescent, Brunswick Heads	Mullumbimby	Approximately 128 sites, 98 campsites, 6 tiny homes, 5 cabins and 19 permanent residents	Evacuation route may be cut at 3.2m at Mullumbimby Gauge before above floor inundation commences at 4.5m	Riverside Crescent Brunswick Valley Way- Rajah Road - Warrambool Road - Orana Road	3.2m at roundabout	Tiny homes may be moveable to Ocean Shores Country Club	Ocean Shores Country Club	Rising Road Access. Peak season Dec-Jan, Easter and School Holidays
First Sun Holiday Park	Lawson Street, Byron Bay	Byron Bay	18 cabins, 24 lodges, 6 huts, 72 campsites	May be isolated from a 10% AEP event.	NA	NA	No moveable dwellings	NA	High Trapped Perimeter. Peak season Dec-Jan, Easter and School Holidays
Belongil Fields	394 Ewingsdale Road, Byron Bay	Byron Bay	200 campsites, 13 cabins	Inundated in a PMF event	Ewingsdale Road	Ewingsdale Road may be cut at 3.52m at Belongil Creek Gauge	Sports ground north of Cavanbah Centre	Cavanbah Centre	Rising Road Access. Peak season Dec-Jan, Easter and School Holidays

Name	Address/Location description	Town/Sector	Number of sites	Risk	Evacuation route	Evacuation route closure	Moveable dwelling relocation location	Evacuation centre	Notes
Ingenia Holidays Byron Bay	5-37 Broken Head Road	Byron Bay	183 campsites, 63 cabins, 39 staff and permanent cabins	Outside of known flood extents	Broken Head Road – Bangalow Road	NA	Red Devil Park	Byron Bay High School	High Flood Island Peak season Dec-Jan, Easter and School Holidays
Reflections Byron Bay - Holiday Park	1 Lighthouse Road	Byron Bay	34 cabins and other roofed accommodation, 76 campsites	Outside of known flood extents but may become isolated for a short period	NA	NA	No moveable dwellings	NA	High Trapped Perimeter. Peak season Dec-Jan, Easter and School Holidays
Maca's Camping Ground	1156 Main Arm Road	Mullumbimby	Approximately 10 campsites	Outside of known flood extents but may become isolated at 2.5m on the Mullumbimby Gauge.	Main Arm Road	Causeway over Main Arm Road may be susceptible to flooding	No known moveable dwellings and located in proximity to higher ground	Upper Main Arm Public School	Rising Road Access. Peak season Dec-Jan, Easter and School Holidays

Name	Address/Location description	Town/Sector	Number of sites	Risk	Evacuation route	Evacuation route closure	Moveable dwellings relocation location	Evacuation centre	Notes
Mullumbimby RLFC and Caravan Park	25 Manns Road, Mullumbimby	Mullumbimby	54 campsites	May be inundated from 4.07m at Mullumbimby Gauge	Argyle Street - Station Street- Burringbar Street - Dalley Street	Argyle St may be cut from 4.6m	Mullumbimby Ex-Services Club	High ground northeast of Mullumbimby St John's Primary School	Low Flood Island. Peak season Dec-Jan, Easter and School Holidays
Mullumbimby Showground Campground	62 Main Arm Road	Mullumbimby	25 campsites	May be inundated from 2.8m at Mullumbimby Gauge	Coral Road - Main Arm Road - Murwillumbah Road	Main Arm Road may be cut from 5.5m	No moveable dwellings	High ground northeast of Mullumbimby St John's Primary School	Low Flood Island. Peak season Dec-Jan, Easter and School Holidays
Suffolk Beachfront Holiday Park	43 Alcorn Street	Suffolk Park	48 camping, 6 Safari tents, 4 cabins, 16 permanent residences	May experience short term isolation	NA	NA	NA	NA	High Flood Island
Discovery Park 02 66857378	399 Ewingsdale Road, Byron Bay	Byron Bay	106 cabins, 34 caravan sites, 104 campsites, 84 permanents sites	Will see onset of flooding at 1.8m on Belongil Creek gauge and be completely inundated by 2.8m	Sunrise Boulevard - Ewingsdale Road	Sunrise Boulevard may be cut at 2.2m on Belongil Creek Gauge. Ewingsdale Road may be cut at 3.52m at Belongil Creek Gauge	Sports ground north of Cavanbah Centre	Cavanbah Centre	Low Flood Island Peak Seasons, December – January, Easter Holidays and Schools Holidays

LIST OF REFERENCES

1. **NSW Government.** *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005 Part 3 Division 3 Subdivision 7 Clause 123.* 2005.

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